PACKAGE engineering

The knack of rolling on labels

Applying the turret lathe principle to pharmaceutical tube and bottle labeling through addition of specially-built devices that speed up labeling, simplify employee work and boost package quality. (See page 31)

Don't let additive testing throw you

A laboratory expert outlines a basis on which to understand material and additive testing—showing it takes something more than cages of animals for feeding studies to keep your package out of trouble with "the law." (See page 52)

How to vibrate product to packages

Delving into the physical and engineering principles that underlie vibratory feeding and which explain how vibrations "send" product particles down a trough and maintain an accurate flow—along with practical operating hints. (See page 58)

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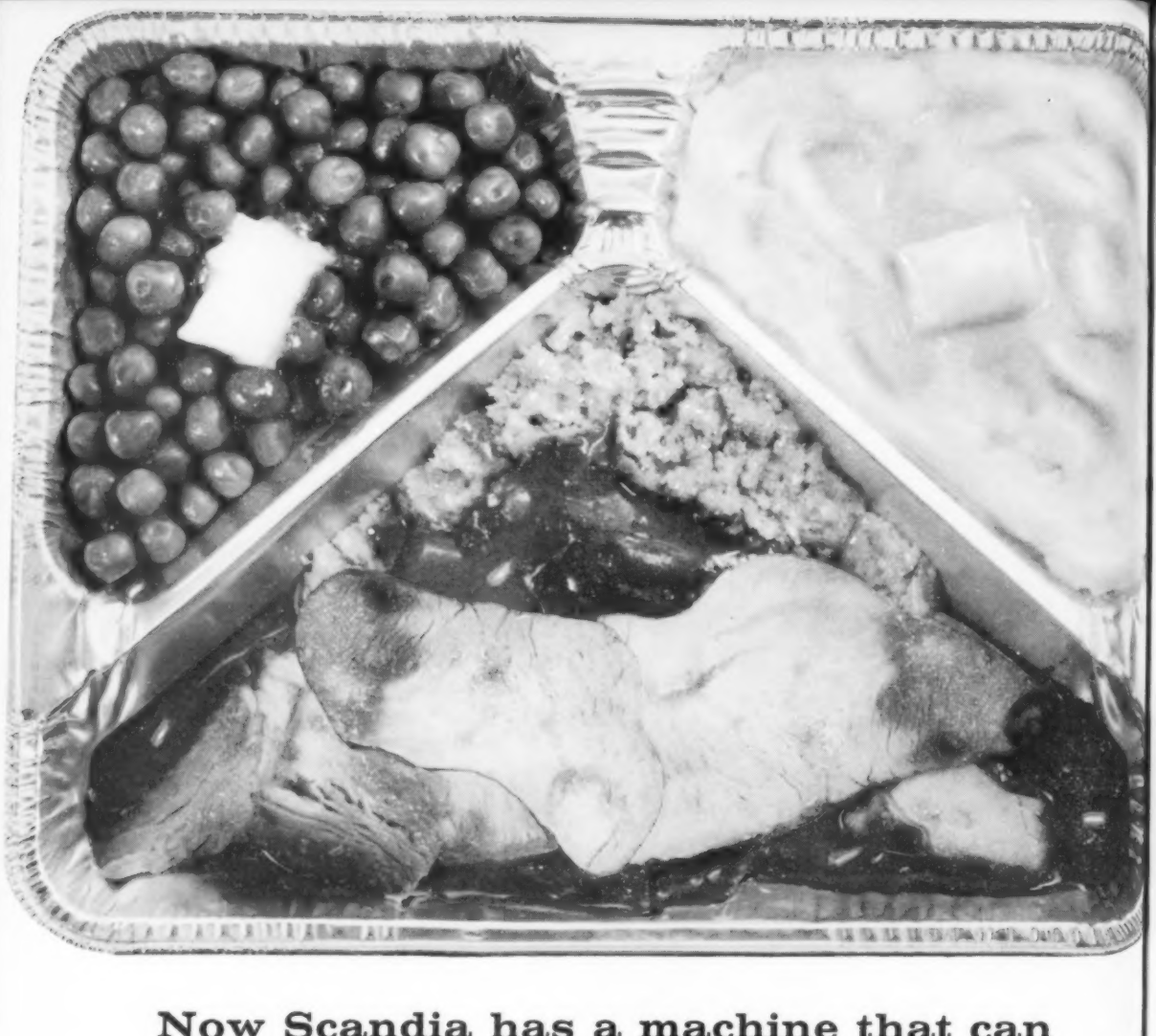

Now Scandia has a machine that can "top-sheet" this tray in one second (or less)

The new Scandia "Tray-Topper" employing continuous feed of roll foil is *guaranteed* to apply foil top-sheets to trays automatically at a speed of 60 trays per minute. Thoroughly use-tested by major frozen dinner processors, the "Tray-Topper" operates efficiently over a speed range of 40 to 80 trays per minute.

You deal directly with the machine manufacturer, purchasing your trays and roll foil stock from *any* foil supplier *you* choose to use.

Two years of design, development and production line testing are back of the rugged new "Tray-Topper" assuring lifetime performance under the most exacting plant conditions. And easy cleaning is "built-in."

In selecting the Scandia "Tray-Topper" for your frozen dinner production line, you are getting the product of an experienced builder of high-speed packaging machines with a world-wide reputation for rugged dependability. Call or write:

Scandia Packaging Machinery Company,
North Arlington, N. J. WYman 1-8400.

SCANDIA
MEANS CRAFTSMANSHIP

For more information circle No. 201 on Reader Service Card, Page 85

Aluminum Foil Packaging–Light Barrier and Vitamin Protector

One of a Series of Reports by Reynolds Metals Company

An early report, No. 6 of this series, presented the advantages of aluminum foil as a light barrier particularly in regard to prevention of oxidative rancidity in products containing oil or fat. Numerous experiments were cited showing the catalytic effect of light as a major contributor to this common form of food deterioration. Report No. 14 dealt with the effects of light on vitamins in enriched, partially baked rolls.

Milk—a Dramatic Example

Of the great number of food products affected adversely by light, however, milk is perhaps the most dramatic example.* Light acts upon milk principally in the following ways: (1) by catalyzing the oxidation of ascorbic acid, (2) by causing the destruction of Riboflavin and Vitamin A, and (3) by stimulating the development of oxidized and activated flavors.

A series of tests conducted for Reynolds Metals Company by the Wisconsin Alumni Research Foundation compared various types of milk in four types of containers: clear glass, brown glass, waxed carton and aluminum foil carton. The milk thus packaged was exposed to both fluorescent light and sunlight. The fluorescent lighting was designed to simulate conditions in a supermarket—the product being placed in an open top refrigerated display case maintained at 50° F., with the lights developing an intensity of about 100 foot candles. Tests under fluorescent light were made prior to exposure, then after 3 and 10 days. Those using sunlight were made prior to exposure, then after 30 and 120 minutes.

Summary of Test Results

Summarizing the separate tests measuring vitamin content before and after the indicated light exposures, the results were as follows. For Riboflavin (Vitamin B_2), no losses of nutritional significance under fluorescent light, but substantial losses in sunlight for milk stored in clear glass and waxed cartons — aluminum foil and brown glass affording excellent protection. For reduced Ascorbic Acid (Vitamin C), much slower rate of loss for milk stored in aluminum foil and brown glass —the pattern appearing similar in fluorescent and sunlight. For Vitamin A, only the milk in clear glass containers showed losses under fluorescent light; in sunlight these losses were very rapid and there was also some loss in waxed cartons.

Tests for Flavor Scores

Tests for flavor scores produced findings of special interest, since there appears to be a correlation between the formation of oxidized and hay-like flavors in milk and the loss of Ascorbic Acid. In the Table shown here, all scores of 35 or under represent a flavor defect — a definite oxidized flavor in whole milk and a pronounced hay-like flavor in skim milk. Here even brown glass failed to retard materially the flavor change. Only the aluminum foil carton proved effective under fluorescent light. And the results in direct sunlight were almost identical.

Manufacturers concerned with vitamin retention, or with other effects of light, such as oxidative rancidity, are invited to call the nearest Reynolds sales office. Or write to **Reynolds Metals Company**, Richmond 18, Virginia.

*Remainder of this report summarizes findings by the Wisconsin Alumni Research Foundation, as set forth in an article entitled "The Effects of Light on Homogenized Whole Milk and Some Fortified Milk Products", by J. J. Birdsall, L. J. Teply, P. H. Derse, in *Food Technology*, Dec., 1958, Vol. 12, No. 12, Page 670.

FLAVOR SCORES OF FOUR TYPES OF MILK STORED UNDER FLUORESCENT LIGHTS AT 50° F.

Package	Homogenized Whole Milk			Vitamin and Mineral Fortified Whole Milk			Vitamins A and D Fortified Skim Milk			Multivitamin Fortified Skim Milk		
	0	3	10	0	3	10	0	3	10	0	3	10
Clear Glass	39	33	33	38.5	33	33	38.5	33	33	38.5	37	33
Brown Glass	39	34.5	34	38.5	37	34	38.5	34	33	38.5	37.5	33
Waxed Paper Carton	39	35	34	38.5	33	33	38.5	36	33	38.5	37	33
Foil Laminated Carton	39	38	38	38.5	38	38	38.5	38	37	38.5	37	37.5

See Reynolds Shows on the ABC-TV Network: "BOURBON STREET BEAT" and "ADVENTURE IN PARADISE" Monday nights.

©1960 by Reynolds Metals Company

For your calendar

May 15-19. Institute of Food Technologists, 20th annual meeting.
Fairmont Hotel and Masonic Temple, San Francisco, Calif. Contact: Col. Charles S. Lawrence, executive secretary, Institute of Food Technologists, 176 West Adams Street, Chicago. *Telephone: ANdover 3-6268.*

June 1. Packaging Institute professional member seminar on aerosol packaging.
Statler-Hilton Hotel, New York, N.Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

June 12-25. Industrial Management Center's 7th Annual Materials Handling and Packaging Training Course.
Lake Placid Club, New York. Contact: James R. Bright, director, Industrial Management Center, 56 Robbins Road, Lexington, Mass. *Telephone: VOlunteer 2-4355.*

July 19-21. Western Packaging and Materials Handling Exposition.
Pan Pacific Auditorium, Los Angeles. Contact: Clapp and Poliak, Inc., 759 Monadnock Building, San Francisco 5, Calif. *Telephone: DOuglas 2-7876.*

September 14. Packaging Institute professional member seminar on folding cartons.
Drake Hotel, Chicago. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

September 28. Packaging Institute professional member seminar on resins.
Statler-Hilton Hotel, New York, N.Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

October 31-November 2. Packaging Institute 22nd Annual National Packaging Forum.
Statler-Hilton Hotel, New York, N.Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N.Y. *Telephone: MUrray Hill 7-8875.*

October 31-November 4. AMA Packaging management course.
The Hotel Astor, New York, N.Y. Contact: John L. Wood, packaging coordinator, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

1961: November 7-10. Packaging Machinery Manufacturers Institute Show of 1961.
Cobo Hall, Detroit. Contact: W. L. Redding, Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22, Pa. *Telephone: ATlantic 1-8552.*

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PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

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Reader Service Cards on Pages 85, 86

Our December, 1960 issue will carry a cumulative editorial index for the year, listing our feature articles by subject, author, and other headings.

—*because of its outstanding machinability*

Paper plates—and all kinds of paper products—take on new sparkle and appeal when packaged in VITAFILM. Yet VITAFILM is no more expensive to use than any of the conventional films.

This strong, wonderfully transparent Goodyear film handles easily in high-speed packaging machinery. It seals quickly and permanently over a wide range of temperatures—doesn't split or run. You don't have to worry about broken packages.

VITAFILM actually transmits the texture of the product right through the package. Shoppers can *feel* the quality as well as see it.

And because VITAFILM doesn't attract dust, it attracts customers as no other film can. Prints beautifully, too.

If you're working with shelf paper, greeting cards, stationery and the like, better get the whole story on the film that's added new glamour to paper packaging. Write: Goodyear, Packaging Films Dept. Q-6432 Akron 16, Ohio.

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The best thing between you and your customer

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PACKAGE engineering®

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BPA

A note from the Publisher

Why not awards for packaging people?

A month or so ago, the Chicago papers carried a story about two United States Steel employees who had won unusually large awards for suggestions they had made that resulted in substantial savings for their company.

Since packaging is frequently referred to as a new frontier for increasing profits through greater efficiency, I wondered how common were awards to packaging people. I have heard the thought frequently expressed that since companies have been attacking for years the costs of manufacturing, compounding, or fabricating, obvious savings are no longer as readily apparent here as they are in packaging.

To see if there had been any substantial awards made to packaging people, I checked some 200 companies packaging everything from food to aircraft parts. Practically every company placed great stress on the suggestion system and publicized award winners, but out of hundreds of awards made, only three or four pertained to packaging.

This low percentage of awards to packaging people seems almost unbelievable. When talking to an engineer in a supplier company, for instance, immediately he tells you of some improperly run packaging line. This comes up so often, I don't understand why more packaging people are not encouraged to make suggestions, with awards given for merit.

Perhaps one reason for this is that it has been only in the last 25 or 30 years that the packaging of merchandise has been accepted as necessary for business survival, and only since the war has business generally been aware of the possibilities of increased profit through the science of package engineering. Perhaps because of packaging's comparative youth, management is not as aware of losing profits on the packaging line as in older areas of the business.

Recently I heard of an annual savings in six figures in the cost of a package that resulted from a minor machine adjustment. The discrepancy in package sizes had been apparent for years, but no one had bothered to try to find out why. It took a trained engineer less than one day to correct the machine.

Another example is that of a packager who complained that his equipment was not performing satisfactorily. The machinery manufacturer's service representative pointed out an overhead delivery system that periodically malfunctioned and buried the equipment. It was a wonder the machinery ran at all.

These examples merely serve to point out the opportunity for savings on packaging lines, savings which could be yours, and which can be instigated by asking for suggestions from your people on your packaging lines. It's certainly worth the try.

Angus J. Ray

Publisher

DO YOU BUY JUST AN ADHESIVE ...OR ADHESIVE ANSWERS TO PACKAGING PROBLEMS?

Buying adhesives involves knowledge in four major areas.

ADHESIVE TECHNOLOGY There are literally hundreds of thousands of adhesive formulas. The selection of chemical and physical characteristics is paramount. Is *your* supplier's salesman well trained—and backed by a competent staff?

PACKAGING MECHANICS Every packaging machine—including 1959's top speed models—is "different" and its idiosyncrasies must be understood before specifying adhesives. Our salesmen take off their coats and work with you, to prevent machining problems from developing.

PACKAGING MATERIALS Changes in packaging materials may require changes in adhesives. We make it our business to keep abreast of this rapidly changing field. Does *your* adhesive supplier?

PACKAGE PERFORMANCE The salesman must understand field demands made on packages. Our "shirt-sleeve" salesmen do.

Why not measure the adhesive salesman serving you against this yardstick.

Freedom from packaging adhesive problems can be had without extra cost if you use the services of a Morningstar-Paisley Technical Service Man. He will be glad to discuss your requirements at your convenience.

MORNINGSTAR-PAISLEY, INC., 630 W. 51st St., New York 19, N.Y. and 1770 Canalport Avenue, Chicago 16, Illinois.

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Continuous Research in Adhesives, Starches, Gums, Resins, Plastisols, to Provide Top Technical Service to All Industry

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VOTATOR rotary piston fillers offer specific advantages, such as greater rigidity with *four point* suspension—thus greater accuracy, self-cleaning valve seats, fine micrometer adjustment *even while in operation*, and easy accessibility of valve guides, ports and rollers. Large diameter Nylon piston and valve rollers reduce wear. In addition, VOTATOR piston fillers feature high-speed no-container, no-fill mechanism, a fully enclosed gear case, adjustable legs, and a wide variety of valve sizes.

VOTATOR gravity fillers are designed for filling liquids having free flowing characteristics. Special seal pads at the base of the valve assembly make a tight seal possible even if top flange of container is not perfect. Extra large valves reduce foaming and increase accuracy. Extra long valve sleeves provide smoother operation, reduce leakage and prevent sticking. Changes for different size containers are quick and easy. Adjustable legs, fully enclosed gear case, a variety of valve sizes and Nylon lifter rollers are more features of VOTATOR gravity fillers.

ROTARY PISTON FILLERS

Model No.*	P6L	P9L	P12L	P18	P18L	P27	P27L	P36	P36L	P6G	P9G
Max. Capacity of Fill (oz.)	40	40	40	20	40	20	40	20	40	160	160
Max. Container Dia.	404	404	404	303	404	303	404	303	404	610	610

GRAVITY FILLERS

Model No.*	G6L	G9L	G12L	G18	G18L	G27	G27L	G36	G36L	G6G	G9G
Max. Capacity of Fill (oz.)	48	48	48	32	48	32	48	32	48	128	128
Max. Container Dia.	404	404	404	303	404	303	404	303	404	603	603

*Model denotes number of stations

Let us show you which is best for you

VOTATOR Fillers are designed to provide accuracy and speed throughout all practical production ranges and container sizes.

In both the piston and gravity types, ranging from 6 through 36 stations, smoothness of operation, ease of integration with associated equipment, rugged, trouble-free construction, and expert know-how and service on each individual installation assure top packaging performance and economy.

Write or call for additional specific information. Bulletins describing both piston and gravity fillers are available upon request. There is no obligation.

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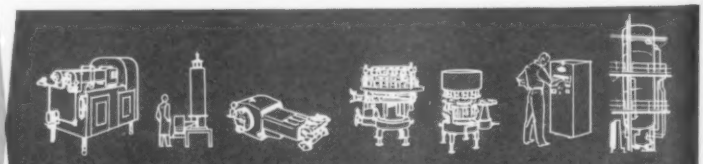


VOTATOR CONTINUOUS PROCESSING EQUIPMENT FOR CHEMICAL & FOOD INDUSTRIES • VOTATOR PISTON & GRAVITY FILLERS • VOTATOR PLANTS FOR FATTY OILS INDUSTRY • THERMEX DIELECTRIC HEATING EQUIPMENT

use this page to develop an idea in 60 seconds

The Polaroid Land camera has had phenomenal sales success. It is expertly designed . . . the materials and workmanship are the best. Now, even the package is something special. The camera and accessories are cushioned in a seat of DYLITE® expandable polystyrene.

DYLITE's unique combination of properties—lightweight, shock resistance and easy moldability to any contour—make it the ideal choice for the variety of platforms and inserts used in Polaroid packages.

Additional properties of strength, water resistance and insulation have made DYLITE a leading choice of package designers in a wide variety of industries. Chances are it can make an excellent improvement in *your* package.

(60 seconds are up. Did you get an idea? Write to Koppers Company, Inc., Plastics Division, Pittsburgh 19, Pennsylvania.)

Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

KOPPERS PLASTICS

DYLENE® polystyrene, SUPER DYLAN® polyethylene and DYLAN® polyethylene are other fine plastics produced by Koppers Company, Inc.

The PULSE/of packaging

Groups in the news:

PACKAGING MACHINERY MANUFACTURERS INSTITUTE is contributing $10,000 to Michigan State University to purchase research and development equipment for MSU's school of packaging. PMMI says this contribution is part of its continuing program to support education in packaging from funds provided by income from the Institute's shows . . . WESTERN PACKAGING AND MATERIALS HANDLING EXPOSITION is planning an educational packaging clinic in cooperation with the Western Packaging Association to be held during the July exposition in Los Angeles . . . AMERICAN ORDNANCE ASSOCIATION has named Thomas P. Wharton, Packaging Consultants Incorporated, deputy chairman of its packaging and handling division . . . AMERICAN STANDARDS ASSOCIATION has revised its specifications for metal drums and pails to meet new ICC regulations. The new spec's cover ten standard steel containers (from 5 to 55 gal.) and are designated MH2.1-1959 through MH2.-10-1959—available from ASA. . . . PACKAGING INSTITUTE wants more nominations for its 1960 professional and corporate awards. It reminds us that any readers wanting to offer nominations should contact PI's offices now (342 Madison Avenue, New York 17, N.Y.) for details.

Packaging across the seas:

Trends in packaging machinery movements indicate a breaking down of trade barriers as some American companies are successfully selling their equipment in foreign nations in competition with locally produced units. And, both by American agencies and direct, various units of foreign equipment find their way into the United States. Some American companies are now manufacturing equipment abroad for importation back into the States—and other companies are considering this, terming the move "interesting." . . . THE KORDITE CO. anticipates licensing the manufacture of its plastic products in Japan; it thinks that the future growth of plastic film production and marketing during the next ten years in the Far East will probably "exceed" that expected in the United States.

WEST VIRGINIA PULP AND PAPER CO. is stepping up its technical services to foreign users. It says quality is becoming more and more a factor in the pulp and paper markets abroad . . . HERCULES POWDER CO. AND A. C. HATRICK, PTY., LTD., its Australian representative, are organizing a new jointly owned company to be headquartered in Springvale (Melbourne), Victoria . . . The DU PONT CO. seeing a bright future for the European Common Market as well as for the seven nations (including the United Kingdom) known as the European Fair Trade Association, or Outer Seven, is expanding its investment in affiliates operating in Europe in order to improve its position in these rapidly growing markets . . . DOW CORNING CORP. has formed subsidiaries in Switzerland and Panama to facilitate service to its licensees and customers abroad.

Trends to watch:

Ever stage a private packaging show? JOHNSON & JOHNSON'S purchasing division did just that and presented exhibits and discussions by 19 suppliers. For five days, J & J purchasing, merchandising, engineering, manufacturing, research, and cost people viewed the exhibits, scrutinized samples, and learned of future trends in packaging and its materials . . . We hear that various pharmaceutical producers are taking a stronger interest in plastics and hope to get plastic packaging materials more closely suited to their needs: ELI LILLY and CUTTER LABORATORIES are stepping up activities of their plastics subsidiaries, and REXALL DRUG AND CHEMICAL is consolidating three divisions concerned with plastics at its new Santa Ana plant. Is this a trend?

Makers of aluminum aerosol cans say that they are chalking up their largest increases in four areas: shaving lathers, hair sprays, room deodorants, and drug and pharmaceutical items. They think the hair product field "seems to have no end" . . . WAYNE STATE UNIVERSITY'S MATERIALS MANAGEMENT CENTER (Detroit) is expanding its programs; has changed its name to APPLIED MANAGEMENT AND TECHNOLOGY CENTER.

Note from the government:

For $0.15 the SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, Washington 25, D.C. will sell you a copy of commercial standard CS227-59 on polyethylene film, a 30-page pamphlet covering dimensional tolerances, types, grades, classes, and kinds of polyethylene film—and test methods. The Commodity Standards Division of the Office of Technical Services, "Business and Defense Services Administration, collaborating with the National Bureau of Standards, spearheaded this project.

More expansion for packaging:

ELECTRONIC MACHINE PARTS, INC. recently moved from LaFayette St. to a new and larger building at 128-11 18th Ave., College Point 56, N.Y. . . . SONNEBORN CHEMICAL & REFINING CORP. has set up an information center to answer queries about the new Food Additives Amendent. . . . TRONOMATIC MACHINE MFG. CORP. has moved to a new 30,000-sq.-ft. plant and offices in the Bronx, New York. . . . THE CHAMPION PAPER AND FIBRE CO. has installed plastic coating equipment to handle its full range of papers and boards.

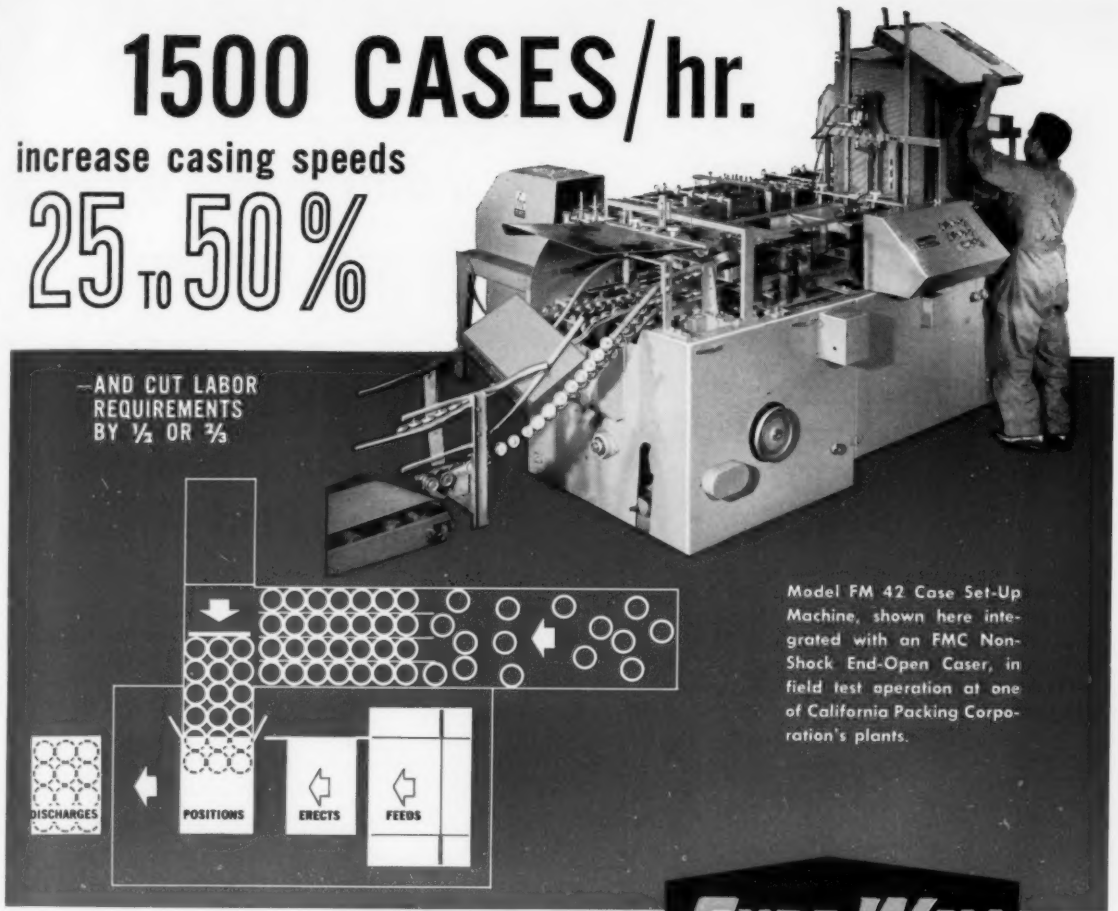
ARMOUR ALLIANCE INDUSTRIES is adding flexible polyurethane foam to its product line and also announces the opening of a new 15,000-sq.-ft. industrial adhesives plant at Philadelphia. . . . AMERICAN CAN CO.'S CANCO DIV. recently opened a new 150,000-sq.-ft. plant in Atlanta. . . . PHILLIPS CHEMICAL CO. will expand its plastics activities to market medium- and low-density polyethylene resins with NATIONAL DISTILLERS & CHEMICAL CORP.'s Houston plant converting Phillips' ethylene to polyethylene.

KOPPERS CO. is enlarging its facilities for production of polystyrene plastics at Kobuta, Pa. which will increase its production by about 15 per cent. . . . ST. REGIS PAPER CO. plans to offer its common stock in exchange for outstanding shares of HOWARD PAPER MILLS, INC.'s common stock. St. Regis has also started production at iis new 70,000 sq.-ft. corrugated sheet plant at Tacoma, Washington and, in Chicago, a new 165,000-sq.-ft. cor-

1500 CASES/hr.

increase casing speeds

25 TO 50%



Model FM 42 Case Set-Up Machine, shown here integrated with an FMC Non-Shock End-Open Caser, in field test operation at one of California Packing Corporation's plants.

—with the NEW SURE-WAY®

CASE SET-UP MACHINE

If you have either an FMC Non-Shock Caser for cans, or a "Sure-Way" Package Caser, consider the additional speed, efficiency and savings in operator manhours now available to you with the new, *fully-automatic "Sure-Way" Case Set-Up Machine.*

Under present conditions, if you are operating your caser in the area of 1200 cases an hour, you are probably using two or three operators to set up and feed cases to the machine. *Add a "Sure-Way" Case Set-Up Machine and experience these benefits:*

- *Up production to 1500 cases an hour*
- *Reduce manpower by 1 or 2 men*

The only manual function involved is that of placing flat shipping cases in the feed magazine of the Set-Up Machine—it's as simple as that. In fact, one man can easily attend two automatic lines at the same time.

An extremely versatile unit, this machine can be made to handle top, side or end-open cases as large as 25″ x 24″ x 18″, or as small as 7″ x 7″ x 3″—and given ranges between these extreme limits. Moreover, it is easily adapted and integrated to existing caser installations, and in many instances may be furnished with a "Sure-Way" Case Sealer for a fully integrated operation.

Get full information on this precision engineered equipment today—for more profitable casing operations tomorrow.

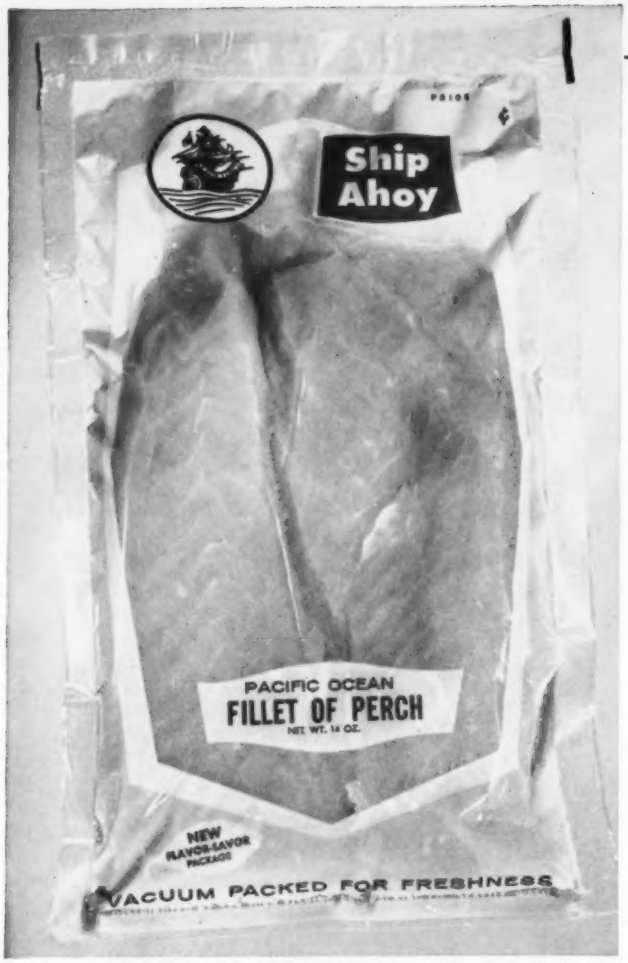
Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

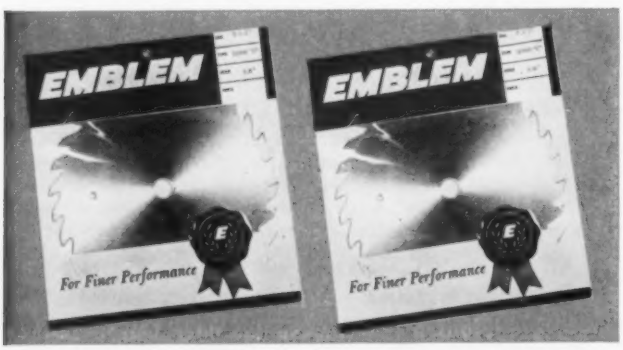
TOUGH PACKAGING JOB?

Read how you get transparency and strength

with laminations made with Du Pont MYLAR*



1. Vacuum pack of "Mylar" and polyethylene has cut down on costly leakers for San Juan Fishing & Packing Co., Seattle. "Mylar" stays strong through freezing, shipping and store handling.



2. New heavy hardware package of "Mylar" and polyethylene bonded to cardboard gives Chicago Saws, Inc., Chicago, Ill., tremendous resistance to puncturing from jagged saw teeth. Cardboard boxes and unsupported film bags previously used weren't tough enough to do the job.

The packages shown here are examples of how laminations and extrusion-coated structures made with Du Pont "Mylar" polyester film can handle the tough ones! Because "Mylar" offers these special advantages: sparkling transparency . . . fantastic strength and puncture resistance . . . indifference to heat or cold . . . great machinability . . . won't ever warp, crack, embrittle or yellow with age.

And "Mylar" can be used in combination with a variety of films and coatings to produce a structure with the *amount of strength* your product needs.

The man to see: Your Du Pont Authorized Converter†. He'll tell you how laminated or coated structures of "Mylar" can cut your costs . . . give you added shelf life . . . open new distribution channels for you. He can supply these combinations as roll stock or pouches.

†For the name and address of Authorized Converters or for added information about "Mylar", just write to: E. I. du Pont de Nemours & Co. (Inc.), Film Dept., Wilmington 98, Delaware.

*"*Mylar" is Du Pont's registered trademark for its brand of polyester film.*

3. Heat-in-bag pouch of "Mylar" and polyethylene lamination is getting wider distribution for Patio Foods, Inc., San Antonio. "Mylar" is ideal for this use because heat or cold can't affect it.

DU PONT MYLAR® POLYESTER FILM

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

A cheaper way to package parts or kits

New Sundstrand-Packmaster produces up to 9000 heat-sealed packages per hour — can be completely changed over in 15 minutes!

Nuts, bolts, or bearings . . . hasps or hinges . . . kits of hardware for over-the-counter sale — the all-new Sundstrand Model 50-A Packmaster offers unequaled versatility and economy for packaging an infinite variety of hard goods (and soft goods, too).

Whether you want airtight, moisture-tight protection or transparency for identification and promotion, or both, the Packmaster answers the need. Packages ranging in size from 2″ to 8″ wide and 2″ to 16″ long are made of heat-sealable foils, films, or papers — transparent or opaque both sides, or transparent one side and opaque the other.

Write for new 50-A Bulletin today. For complete recommendations, submit samples and describe your requirements.

MARK OF SUNDSTRAND RELY-ABILITY

SUNDSTRAND-AMERICAN BROACH
ANN ARBOR, MICHIGAN
Division of SUNDSTRAND CORPORATION

AUTOMATIC HOPPER FEEDERS can be added to provide accurate counting and faster loading of nuts, bolts, screws, washers, etc., in individual packages or kits.

Planned Packaging moves merchandise

Shake it... squeeze it... but you can't poof it!

Sealed, tight, completely, from the time it leaves the filling line till it reaches the user's hands. Developed by Packaging Corporation of America technicians to eliminate use of inner bags or overwraps for cereals, dry powdered foods, soap products, chemicals and many others, this exclusive Calk-Seal* technique provides positive protection against sifting and infestation. And the single structure package multiplies filling line speed, reduces handling costs. Every day more and more packagers of such products are turning to the advantages of Calk-Seal as a superior packaging method. Developing and providing such advanced packaging techniques is but one of countless ways in which Packaging Corporation of America's concept of Planned Packaging, implemented through integrated national facilities, produces better packaging . . . more sales. Whether your requirements are large or small, regional or national, we welcome the opportunity to help you.

*Machine and process patents applied for.

Packaging Corporation of America

1632 CHICAGO AVENUE, EVANSTON, ILLINOIS

Cartons • Containers • Displays • Egg Packaging Products • Molded Pulp Products • Paperboards

Cigarette carton closing at P. Lorillard Company, Inc. where the advantages of Thermogrip adhesives were realized almost two years ago.

THERMOGRIP ADHESIVES

Speed Carton Closing 75% Help Carton Opening

If you want to seal cartons faster, or open them easier, Thermogrip adhesive is your answer. In one plant alone, production from closing machines has been increased 75% and total factory cleaning time reduced from 14 to 3.4 hours per shift. Thermogrip adhesives permit a sealing rate of 2 cartons a second.

Thermogrip adhesive applied in ten ⅛" dots along the flap keeps cigarette cartons closed during packing, transit, and handling. Because quick-setting Thermogrip does not penetrate the surface, cartons are easily opened for tax-stamp application without damaging the carton or the contents. Best of all, one three-pound reel of Thermogrip seals 59,300 cartons!

Thermogrip can be applied at top machine speeds in dots, dashes or continuous strip in a variety of widths on plain boards, waxed boards, porous paper, aluminum foil, polyethylene, and many other packaging materials.

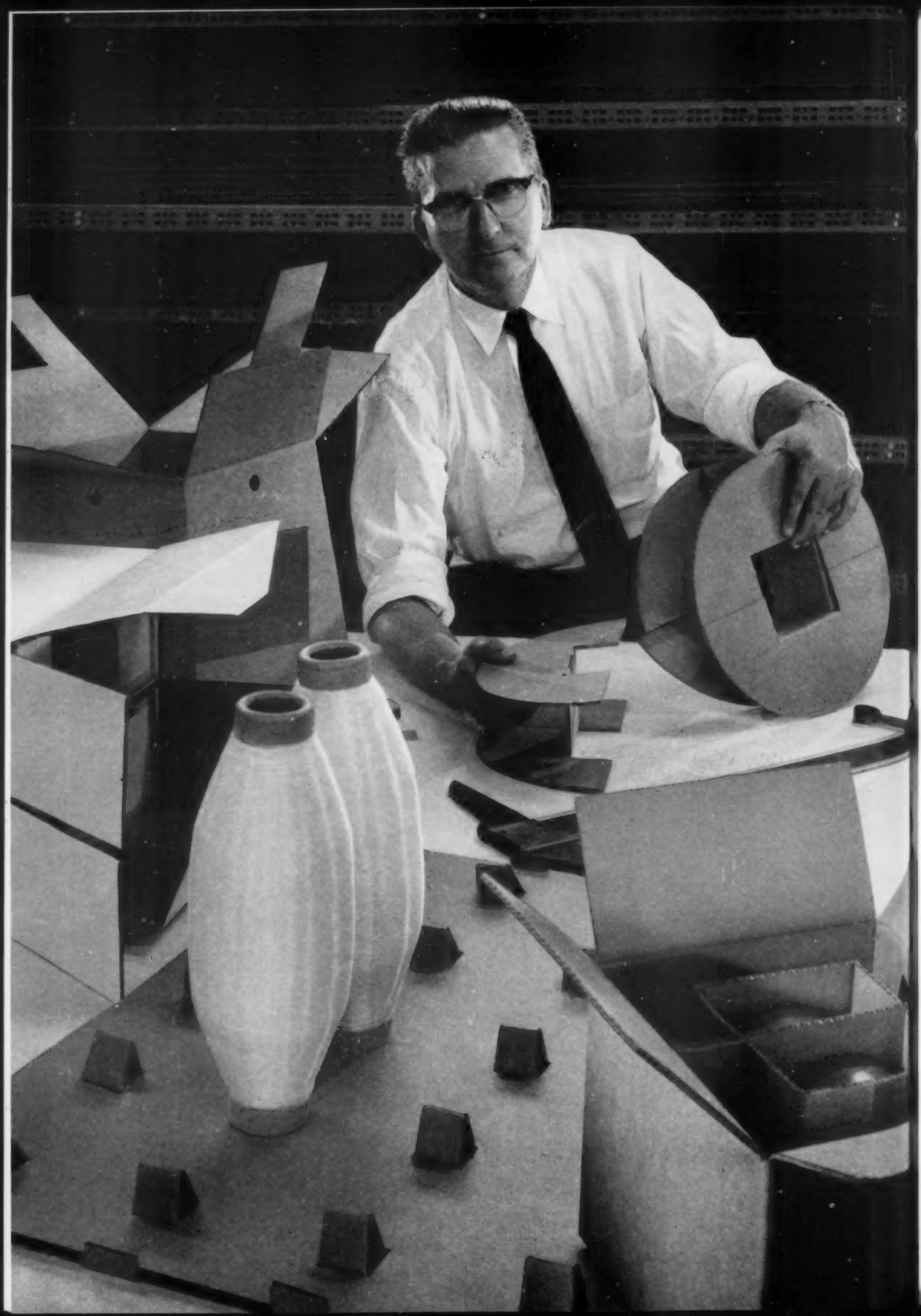
If you are interested in clean, dry, high speed sealing, pick up your phone and call us right now or write explaining your carton sealing objectives.

Leading cigarette manufacturers are now using THERMOGRIP adhesives for better, faster closing and for reducing losses on ten pack cartons.

United

UNITED SHOE MACHINERY CORP.
140 Federal Street, Boston, Mass.
LIberty 2-9100

For more information circle No. 211 on Reader Service Card, Page 85



May,

Nobody laughs when he sits down to play

There's a good reason. Ernie Wright plays for pretty high stakes. In terms of packaging savings to users of corrugated boxes they frequently run to thousands of dollars. Tens of thousands in some cases.

It doesn't matter what the product, Ernie can usually find a way to box it better. His record as an economy expert is largely built on imaginative use of inner packing. A corrugated box specialist for 30 years, Ernie has probably created more cost-cutting interior safeguards than any man in the business.

One Union-Camp box he developed for a textile company featured a unique die-cut unit that provided positive protection by "floating" the individual spools of yarn. Another box design for a business machine manufacturer made use of a corrugated inner "saddle" which firmly anchored the box's contents—yet contributed to an overall packaging cost reduction of 25 per cent!

A third box, constructed in cooperation with an instrument maker, weighed ten pounds less than the previous container . . . and measured nine inches shorter. Nevertheless the new design gave increased protection to the delicate instruments at a significantly reduced overall cost. While these are just a few of the types of products which have benefited from a Union-Camp corrugated package analysis, they're typical of the kind of packaging efficiency we can often help you achieve.

Perhaps Ernie Wright can come up with a new packaging idea for your product. Perhaps several. It might be an unusual anchoring device. A more effective type of cushion against impact or vibration. Or, possibly a simple twist that would involve nothing more than a minor modification of the box design you are now using. In any case, it costs nothing to find out. While you're about it why not look into Union-Camp's complete corrugated box service.

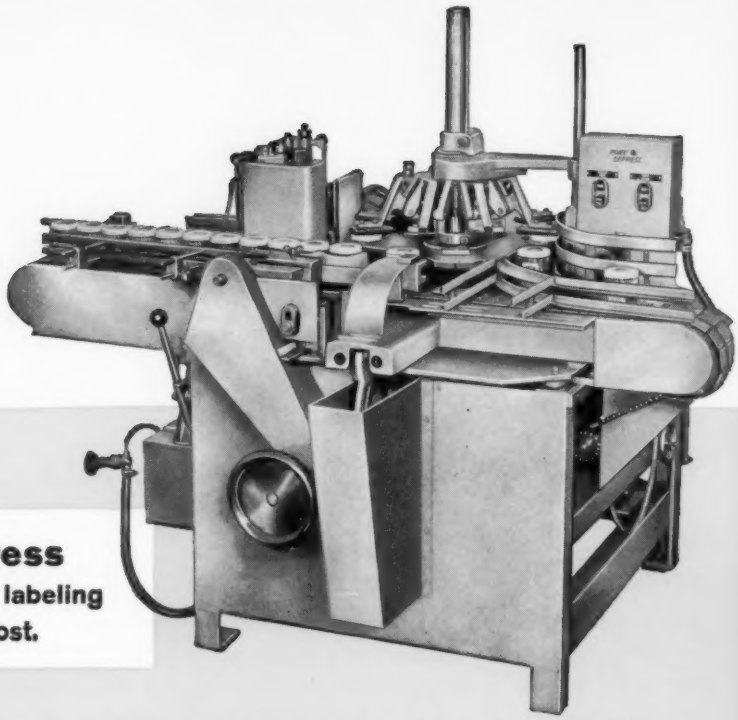
You'll be surprised at the savings it can offer.

UNION-CAMP®

CORRUGATED BOXES

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

Plants: Savannah, Georgia · Trenton, New Jersey · Chicago, Illinois · Lakeland, Florida · Spartanburg, South Carolina · Jamestown, North Carolina
Subsidiaries: Allied Container Corporation, Dedham, Massachusetts
The Eastern Box Company, Baltimore, Maryland.



Pony Express
delivers precision labeling at low unit cost.

Fully automatic SUCTION labeler handles any shape label and container

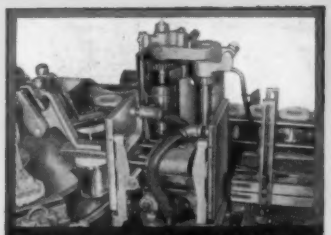
Your first and immediate saving with the Pony Express is that you eliminate the operator. Compared with semi-automatic labeling, you increase production as much as 50 per cent and *at one and the same time* you both reduce cost and improve package appearance.

The exclusive suction-principle operation of the Pony Express removes labels from hopper without assistance from the glue. Glue is used only for adhering labels to containers. Label registration is accurate to within 1/64" regardless of container's shape.

The Pony Express has a micro-controlled glue system that coats each label with a fine, even film of adhesive. This over-all gluing means containers are labeled with edges down tight. Glue seepage, loose-corners, hand retouching are eliminated entirely.

The Pony Express can be used for short runs as well as for volume production. Change-over from one job to the next takes only 25 minutes for both label and container. On large runs, the non-stop label loading feature permits longer, uninterrupted production.

Prices start at less than $6000. Write for new bulletin.



Suction Guarantees Perfect Label Placement. Label is controlled by the positive holding force of suction until the moment it is adhered to the container. It cannot shift in transit. Perfect registration is absolutely automatic.

Labels tapered bottles at full speed

After code-numbering on a NJM Code-O-Matic,® Riders Ltd., N. Hollywood, Calif. labels these tapered bottles with accurate register, at full speed, on their Pony Express.

MAKERS OF THE PONY LABELRITE • NEW JERSEY MACHINE CORP. • NJM

NEW JERSEY MACHINE CORPORATION

AUTOMATIC LABELING • CARTONING • PAPER BOX MACHINERY

FACTORY SALES AND SERVICE BRANCHES | 325 W. HURON ST., CHICAGO 10, ILL. 2500 W. 6th ST., LOS ANGELES 57, CALIF.

MAIN OFFICE & PLANT • 16th ST. & WILLOW AVENUE, HOBOKEN, N.J.

For more information circle No. 213 on Reader Service Card, Page 85

Fibreboard Solves Industry Need with New Fibresix® Carton. Hamm's Western Division is sending its glass cans to market in the new Fibresix Display Carton. Precisely engineered and unique in construction, Fibresix separates bottles at top and bottom to prevent breakage and projects a larger, more sales-effective billboard display area at both ends of the carton. In addition, Fibresix provides up to 50% savings on packaging costs!

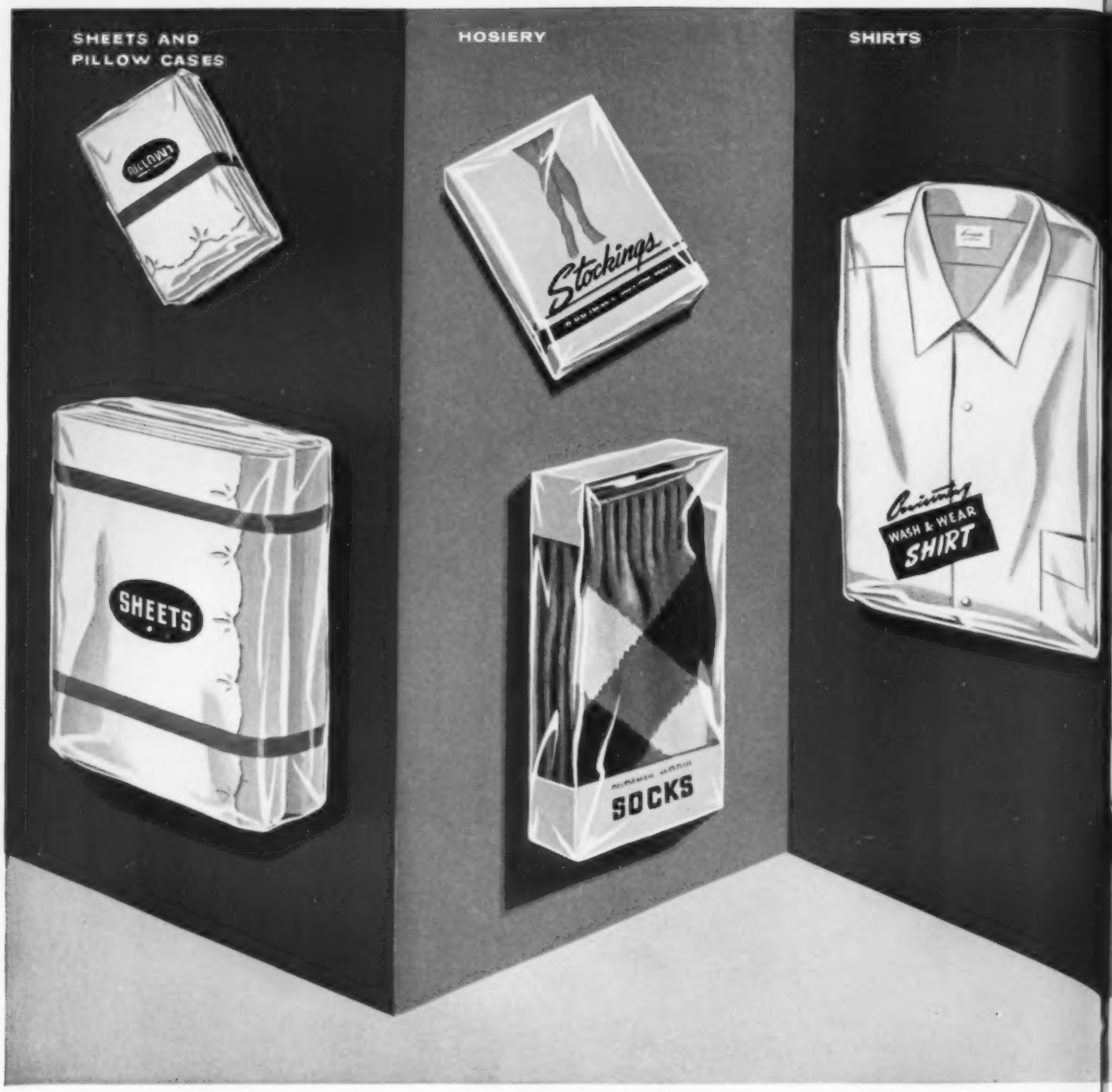
Fibresix exemplifies Fibreboard's ability to serve you. Fibreboard is the only major carton and container manufacturer in the United States whose entire marketing effort . . . scientist to salesman . . . is organized to meet the marketing problems in your specific industry. And for actual package production, Fibreboard's facilities are the largest, most modern in the whole wide West!

For any possible packaging assistance, phone or write: Fibreboard Paper Products Corporation, 475 Brannan Street, San Francisco, California. **Where Specialists in YOUR Market Work on YOUR Packaging Needs . . .**

FIBREBOARD

Chicago, Denver, Los Angeles, New York, Omaha, Seattle and other major cities.

Fibreboard also serves the West with its complete line of building and decorating materials . . . marketed under the PABCO banner since 1884.



AVISUN *OLEFANE** POLYPROPYLENE FI

Now... better packaging at lower cost wit

MAKES A CRYSTAL-CLEAR SHOWCASE for your products. AviSun Olefane, with its excellent clarity and gloss, displays goods with brilliant sparkle and appeal.

MORE FILM PER POUND. Highest yield of any packaging film. A real opportunity for savings in packaging costs.

PROTECTS GOODS LONGER. Olefane is unaffected by changes in humidity, doesn't dry out, become brittle or crack. Keeps goods factory-clean almost indefinitely.

TAKES ROUGH HANDLING. AviSun Olefane has great resistance to tearing and high tensile strength—this makes possible stronger wraps from thinner gauges. It also has good abrasion resistance—maintains high gloss and transparency—keeps eye appeal longer.

HAS A QUALITY FEEL. This remarkable new packaging film has just the right flexure . . . neither too limp nor too stiff. This adds up to instant sales appeal.

PRINTS sage can b Olefane. printing **...AND** of its hig speeds on *it has a n*

NE FILM FOR PACKAGING TEXTILES

ost with new Olefane polypropylene film

PRINTS BEAUTIFULLY. Your trademark and sales message can be printed in sales-stimulating full color on treated Olefane. Flexographic printing, rotogravure and other printing methods may be used.

...AND ITS MACHINABILITY IS EXCELLENT! Because of its higher stiffness, Olefane performs at advantageous speeds on machines designed for thermoplastic films. *And it has a non-critical heat seal range!*

AVISUN TECHNICAL SPECIALISTS can answer your specific questions and help you plan for better packaging at lower cost with Olefane film.

Write today for full information.

AVISUN CORPORATION
319 Post Road Marcus Hook, Pa.
*a trademark of AviSun Corp.

AVISUN*

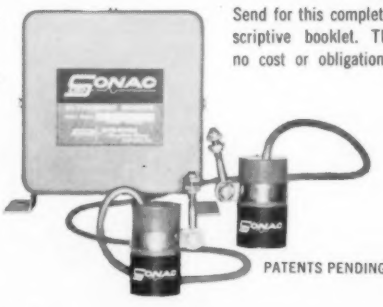
For more information circle No. 215 on Reader Service Card, Page 85

A NEW, ULTRA-SONIC, NON-CONTACT SENSING AND SWITCHING SYSTEM

SONAC

Here truly is a new dimension in automated controls! Delavan's new SONAC uses ultrasonic energy for its "beam". This new concept offers many advantages over available sensing devices. SONAC has no lamps to burn out . . . nothing to replace . . . eliminates down time. SONAC is unaffected by vibration, dust, industrial contamination or ambient light. SONAC will sense ferrous and non-ferrous metals, liquids or solids, transparent or opaque materials, yet requires less power than an ordinary flashlight. These are a few of SONAC's advantages.

Send for this complete descriptive booklet. There's no cost or obligation.



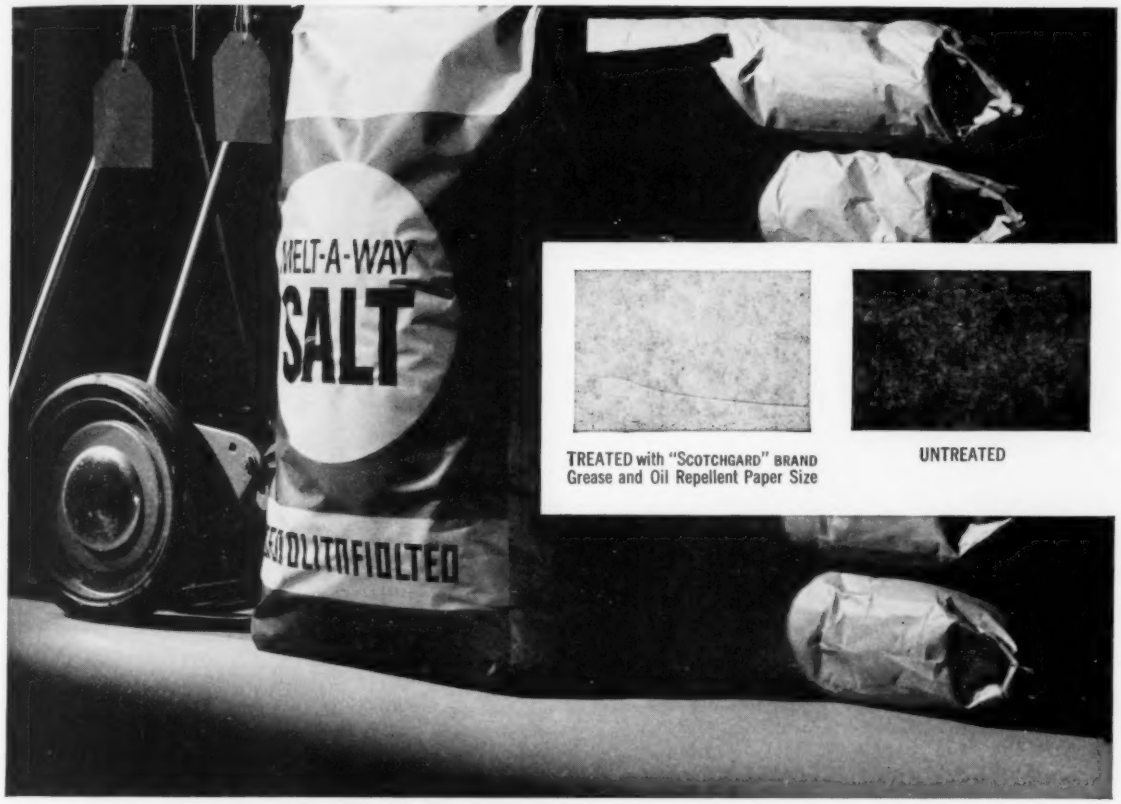
PATENTS PENDING

DELAVAN Manufacturing Company

WEST DES MOINES • IOWA

3M COMPANY CHEMICALS

THE RAW MATERIALS OF PROGRESS



Asphalt penetration problems end for paper treated with SCOTCHGARD®

GREASE & OIL REPELLENT PAPER SIZE

See for yourself! Even hard-to-control bleeding of kraft asphalt laminate virtually halts when the paper is treated with SCOTCHGARD BRAND Grease and Oil Repellent Paper Size.

The bleached kraft samples, inset above, bear this out. They were continuously exposed to temperatures ranging from 130°F. to 140°F. for 57 days. At the end of that period, the untreated sample is nearly black from bleeding. Yet the sample treated with SCOTCHGARD Paper Size is almost factory-fresh. Think what this can mean for you—

Fresh, legible packages that remain attractive all the way through distribution, right to the user. And SCOTCHGARD Paper Size does this all without sacrifice of color, strength, porosity, flexibility, or any other important characteristic. Because it is a member of the 3M family of fluorochemicals, which are not laid on as films or coatings, *it penetrates each paper fiber* for maximum grease and oil resistance.

Let SCOTCHGARD Paper Size help you in these many ways: Prevent unnecessary wax penetration on waxed papers. Permit use of thinner-than-normal polycoating. Permit packaging of greasy and oily parts without penetration. Prevent grease crawl and staining at seams and closures in multi-wall bags. "Hold out" dope and prevent strike-through in carbonizing tissue. Give unparalleled resistance to asphalt penetration. SCOTCHGARD Paper Size has helped solve packaging problems of long standing for many of America's leading manufacturers.

So, too, has KEL-F® Brand Plastic Film for flexible, see-through packaging requiring heavy-duty protection without bulk. Ideal for paints, cosmetics, pharmaceuticals and chemicals, KEL-F Brand Plastic Film is completely impermeable, virtually unaffected by heat, caustics, acids, temperatures, withstands handling, storage, shipping. Provides maximum packaging security, good looks and convenience.

Learn how these 3M products can help solve your problems. Just state the facts in a letter addressed to: 3M Chemical Division, Dept. KCA-50, St. Paul 6, Minn.

"SCOTCHGARD" and "KEL-F" are Reg. T.M.'s of 3M Co.

CHEMICAL DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

The Importance of Logic in Packaging Machine Design.

The most successful packaging machine is the most simple in concept. Unnecessary complexity invariably taxes itself in speed, performance, efficiency and maintenance.

Triangle originally entered the bag making, filling and sealing field to develop a single tube machine. No other consideration was allowed to complicate the basic requirements. That's why Triangle's single tube machine has been so unusually successful.

What could be a more logical starting place for developing a multi-tube bag maker, filler and sealer . . . ?

NOW TRIANGLE MORE THAN DOUBLES THE ADVANTAGE OF ITS REMARKABLE BAG MAKER, FILLER AND SEALER!

Regardless of whose equipment you're using or whether you're presently considering equipment purchase, you owe it to yourself to investigate the new Triangle Twin machine. The reason? It has all of the advantages, all of the flexibility, all of the efficiency our single tube equipment has without any of the disadvantages common to all other dual tube machines.

Briefly, Here's Why . . .

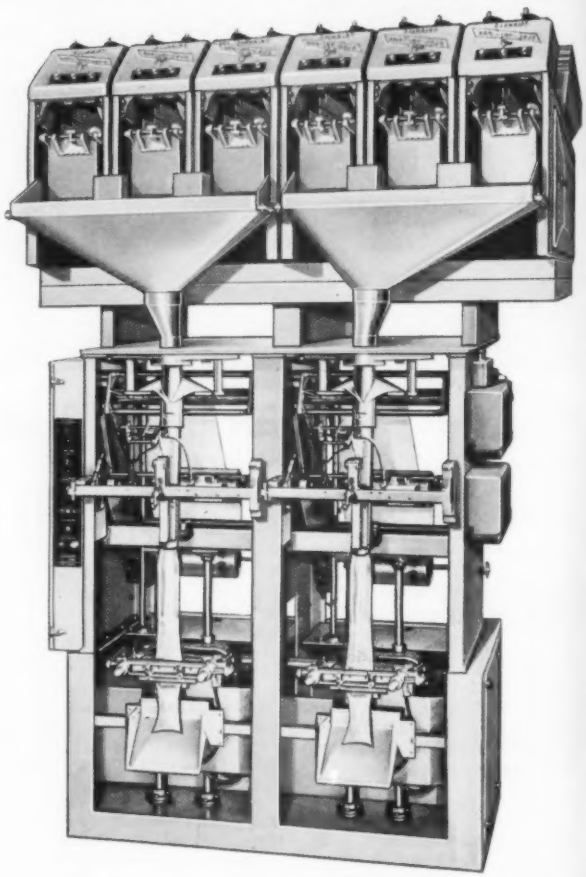
The Triangle Twin is fast . . . 120 bags per minute with any bag material (90 per minute with polyethylene). It will handle a full range of bag sizes up to 8″ x 16″.

The Triangle Twin is a fully integrated combination of two, efficient single tube machines with one common drive . . . yet sealing jaws operate independently to permit one side to operate while the other side is down for film threading or routine maintenance. This feature results in *less* downtime and more production than normally expected.

The Triangle Twin mounts up to *six* Elec-Tri-Pak net weighing scales on top where they belong. No costly intermediate elevator feed is required. Volumetric filler and other synchronized systems are also available.

The Triangle Twin has all the performance of the time proven single tube bag maker and filler . . . fast, simple changeover for all materials from cellophane to polyethylene . . . quick return jaw assembly . . . simple, functional design of sealing jaws. . .

See for yourself how far the Triangle Twin has advanced the concept of high speed bag making, filling and sealing. Write today—without obligation, of course

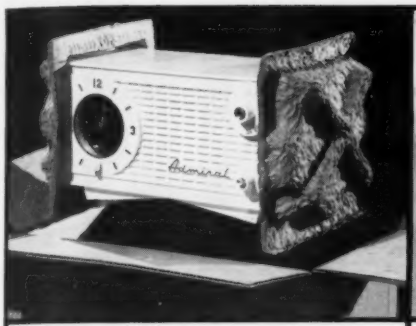


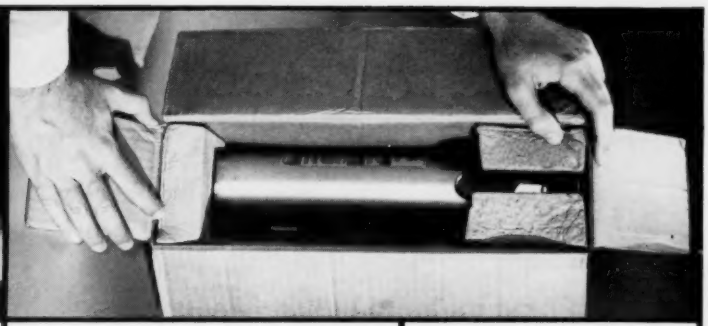
. . . . . YOU REALLY 37 YEARS SAVE WITH . . . . . .

F-7L.22

TRIANGLE PACKAGE MACHINERY COMPANY

6631 West Diversey Avenue, Chicago 35, Illinois • Telephone: TUxedo 9-0200





Radio manufacturers report package savings up to 9 cents per unit on table models, and labor savings up to 3 cents per unit, after switching to Tekmold.

what a variety of shapes and sizes . . .

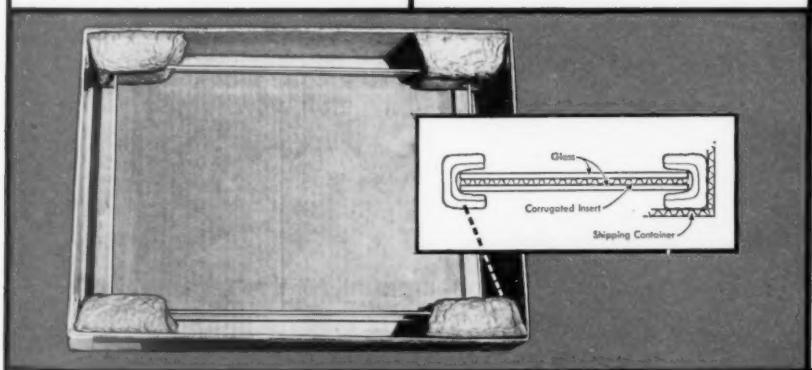
yet they all pack safely and economically in

TEKMOLD®

protective packaging

Three custom-molded Tekmold caps reduce costly interior assembly in packaging this fire extinguisher. Only four movements are needed to put the unit in the outer container.

The more valuable or vulnerable the product, the more necessary to give it Tekmold protection. This projector travels safely because of Tekmold.



Positive protection is given to fragile or sensitive products like this *p*H electrode. The rigid, form-fitting, molded Tekmold packaging "suspends" the contents... cushions against shock from any direction.

This photo and diagram shows how flat sheets, such as glass, may be safely and economically "floated." Tekmold packaging is tailored to your job... ready to use.

Bemis Tekmold, the custom-molded protective packaging, costs you less than conventional methods because it replaces multiple-piece, die-cut and scored corrugated assemblies . . . and also minimizes packing labor —there's no slow hand-folding and assembling.

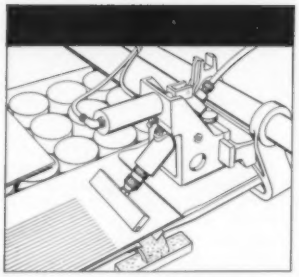
Tekmold is *adaptable*. It may be the real answer to your problem. For the *complete* Tekmold story, write, wire or phone us today.

TEKMOLD PRODUCTS PLANT

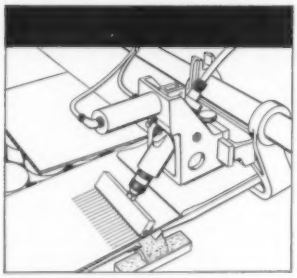
325 27TH AVENUE N. E. • MINNEAPOLIS 18, MINNESOTA

BEMIS BAG CO.

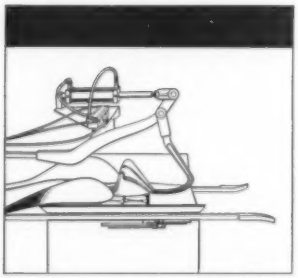
WHERE FLEXIBLE PACKAGING IDEAS ARE BORN



Skip-gap air cylinder raises applicator at the precise moment the flap reaches the skip-gap position.



Applicator is returned by an air cylinder to the gluing position after the skip-gap. The flap itself re-opens the valve allowing glue to flow.



Kicker arm folds down trailing inner flaps as outer flaps are plowed outward. If no case is present, no "kick" takes place, thus saving air and unnecessary mechanical movements.

WRITE FOR COMPLETE INFORMATION

THE STANDARD-KNAPP

GLU-LINE

UPGRADES YOUR GLUER*

* NOT APPLICABLE TO S-K 429 GLUERS BUILT PRIOR TO MARCH 1935

SIMPLEST, STINGIEST, NEATEST SYSTEM FOR GLUING CASES . . . AND IT'S READY NOW

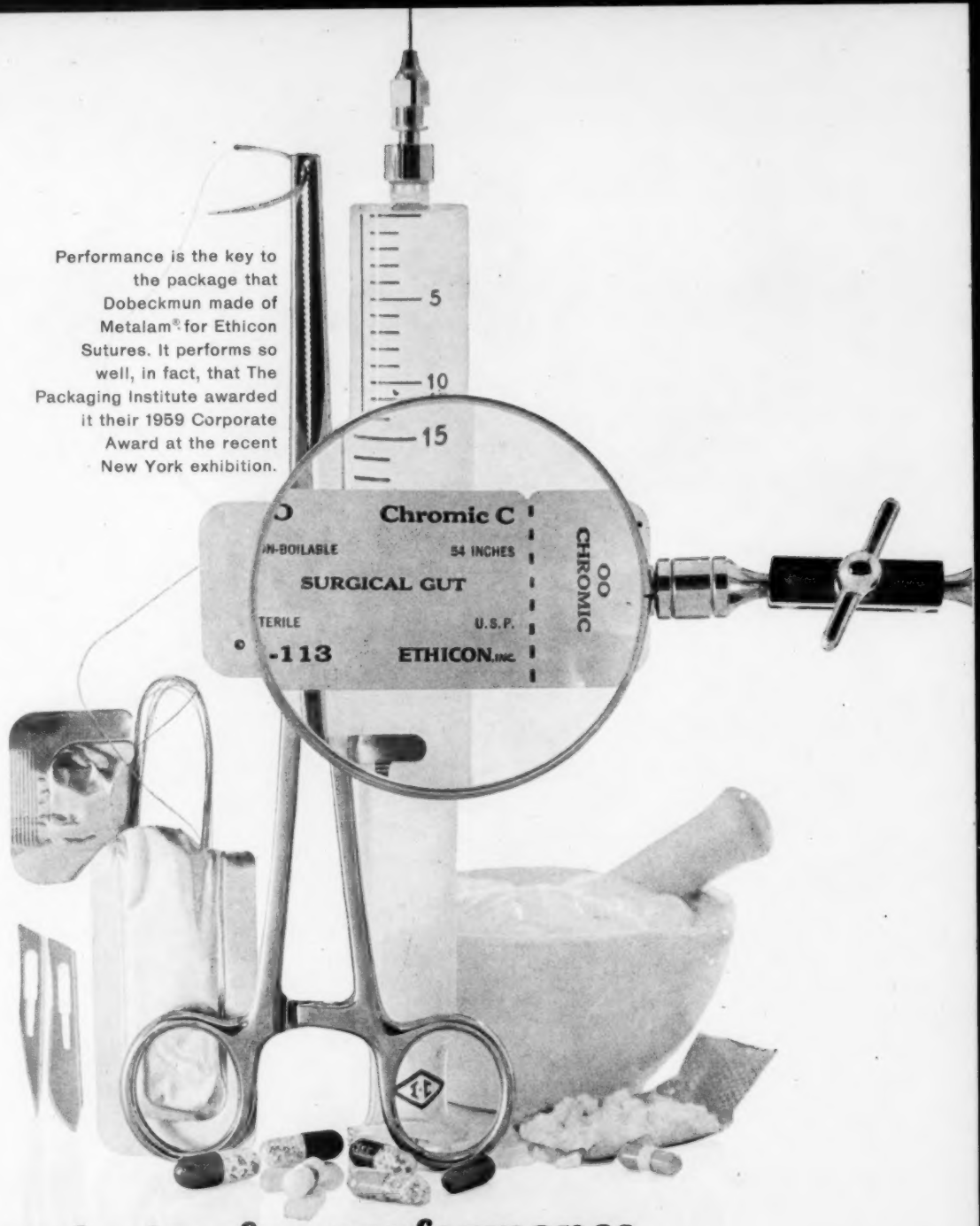
Emhart Manufacturing Company
Portland, Connecticut
Standard-Knapp Packaging Equipment

EMHART

For more information circle No. 220 on Reader Service Card, Page 85

Circle No. 221 on Card, Page 85

Performance is the key to the package that Dobeckmun made of Metalam® for Ethicon Sutures. It performs so well, in fact, that The Packaging Institute awarded it their 1959 Corporate Award at the recent New York exhibition.

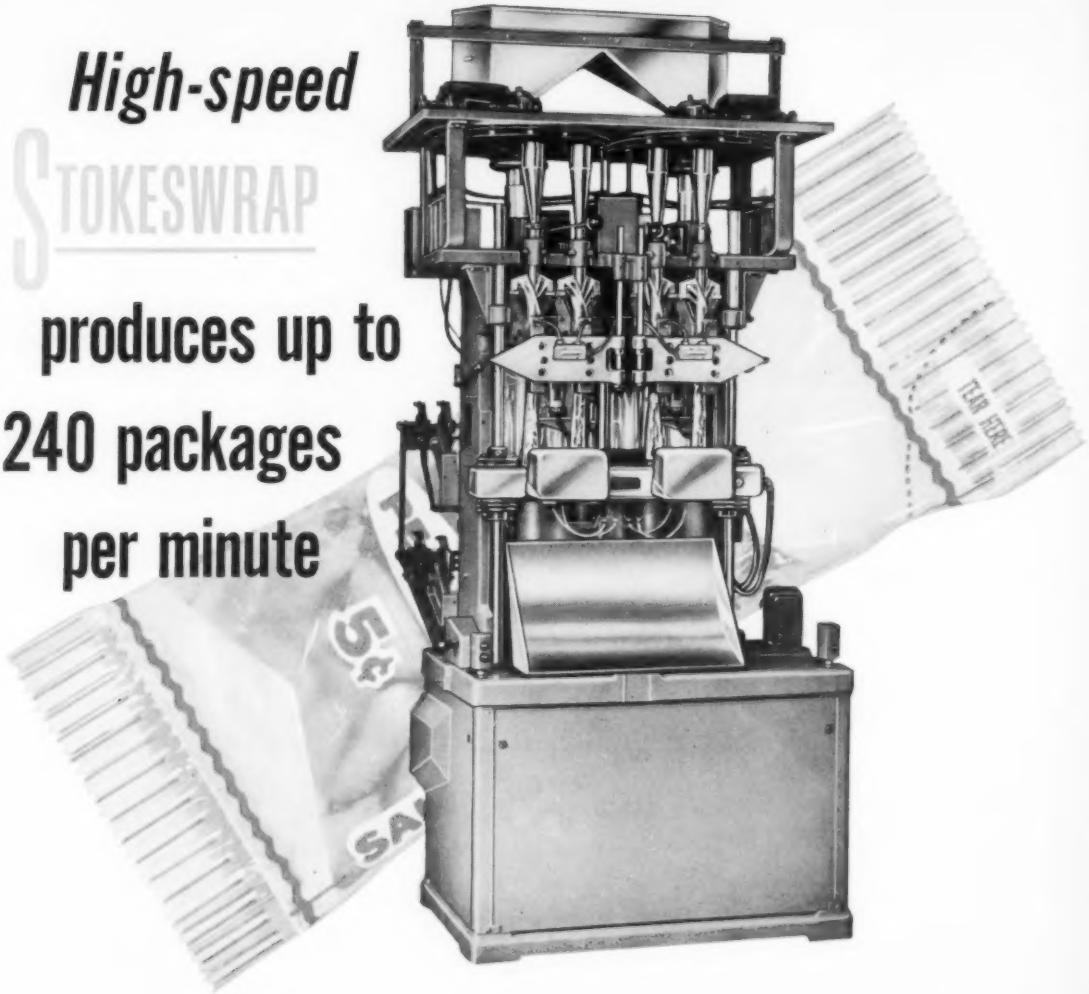


packages for performance

DOBECKMUN

The sterility of sutures has always been vitally important. The point about the new Metalam package is that it retains this sterility indefinitely in a foolproof way that removes all risk of accidents and makes the nurse's job easier. Metalam is a lamination of foil and film with qualities that make it ideal for packages of all shapes and sizes requiring the optimum in protection. We are happy this package won the Corporate Award but what pleases us most is that it was the outcome of very close cooperation between Ethicon and us. That's the way we'd like to work with you when you need Packages for Performance by The Dobeckmun Company, a Division of The Dow Chemical Company, Cleveland 1, Ohio • Berkeley 10, California. Offices in most principal cities.

High-speed STOKESWRAP produces up to 240 packages per minute



Designed to deliver maximum production in minimum space, the new four-tube Stokeswrap can form, fill and seal as many as 240 flexible packages per minute. One four-tube Stokeswrap costs less than . . . yet equals the output of . . . two conventional two-tube units. It is ideally suited for plants where floor space is limited, where increased production is desired and a replacement for obsolete equipment.

Depending on requirements, the four-tube Stokeswrap will form "pillow" or "four seal" types of packages from printed or unprinted roll stock of most heat sealable materials and laminations. Each tube has its own electric eye registration to assure proper positioning of the package design. Either conventional or impulse sealing can be provided with sealing and cut-off achieved in one simple operation. Webs are held in constant tension to eliminate jamming and other troublesome operations.

Capacities range from one gram to three ounces depending on product characteristics. Package sizes can be handled up to 2⅜" x 6¾". Special attachments for strip packaging, gas-fill packaging, coding, imprinting and hole punching can be supplied.

For complete information, write to:

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

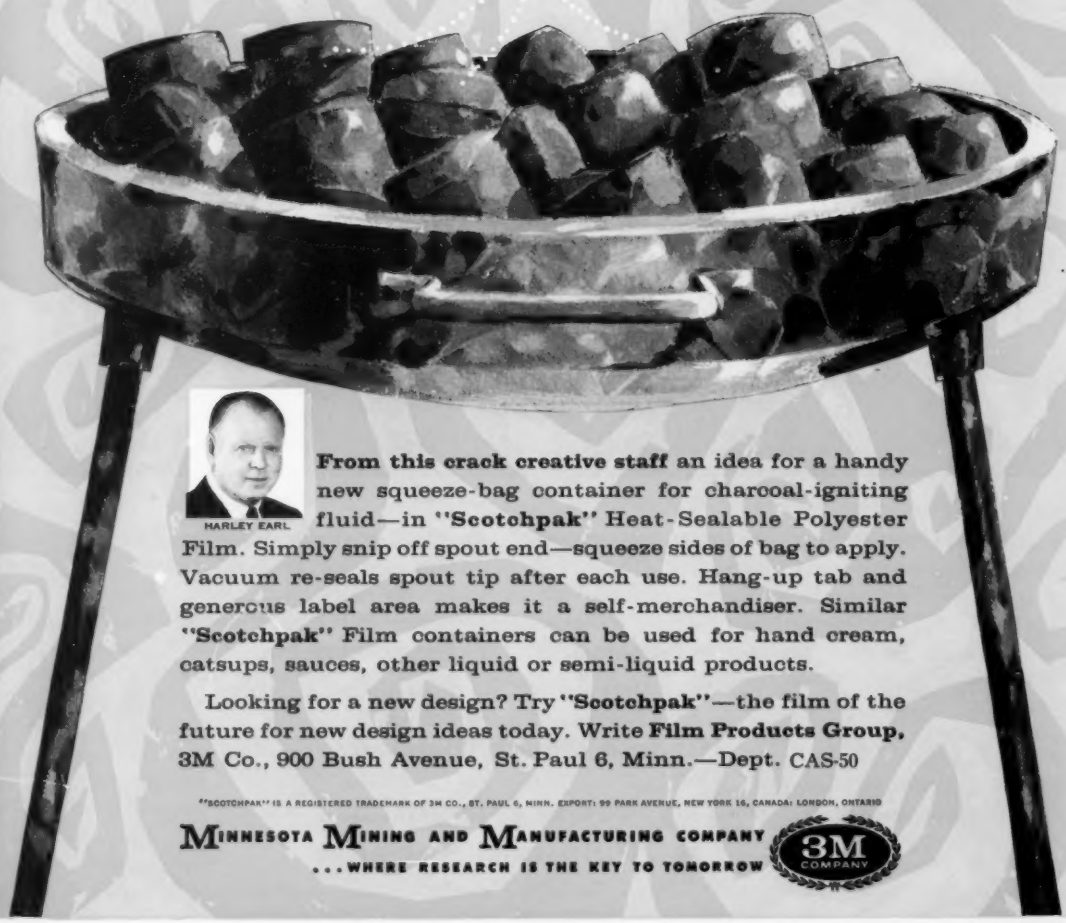
FMC Packaging Machinery Division

Stokes & Smith Plant

4994 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

3M PRESENTS . . . creative packaging ideas by distinguished designers

Harley Earl Associates design in "SCOTCHPAK"



HARLEY EARL

From this crack creative staff an idea for a handy new squeeze-bag container for charcoal-igniting fluid—in **"Scotchpak"** Heat-Sealable Polyester Film. Simply snip off spout end—squeeze sides of bag to apply. Vacuum re-seals spout tip after each use. Hang-up tab and generous label area makes it a self-merchandiser. Similar **"Scotchpak"** Film containers can be used for hand cream, catsups, sauces, other liquid or semi-liquid products.

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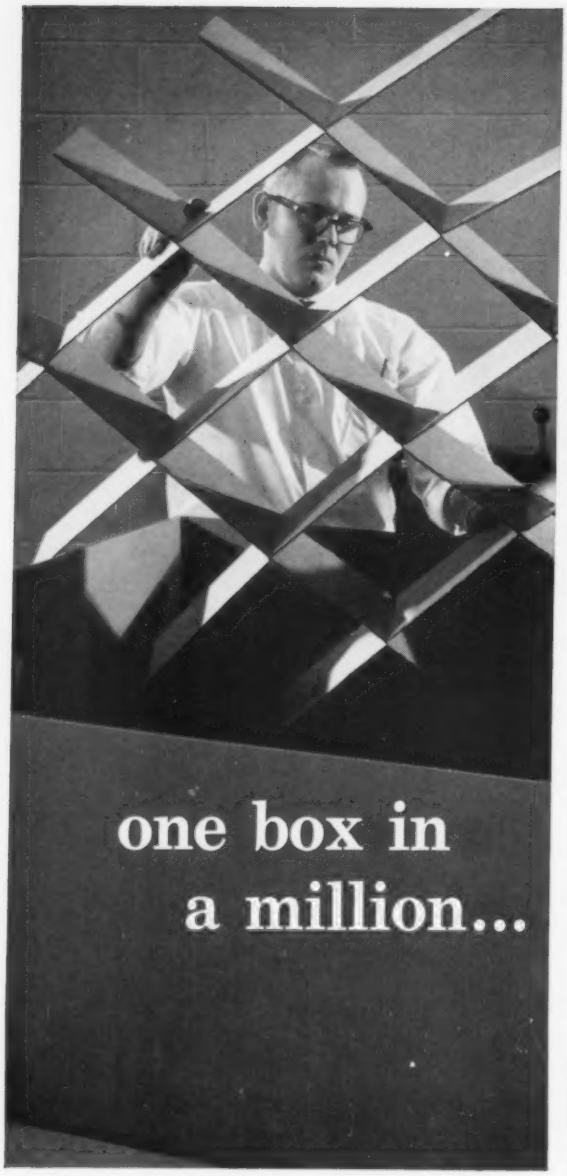

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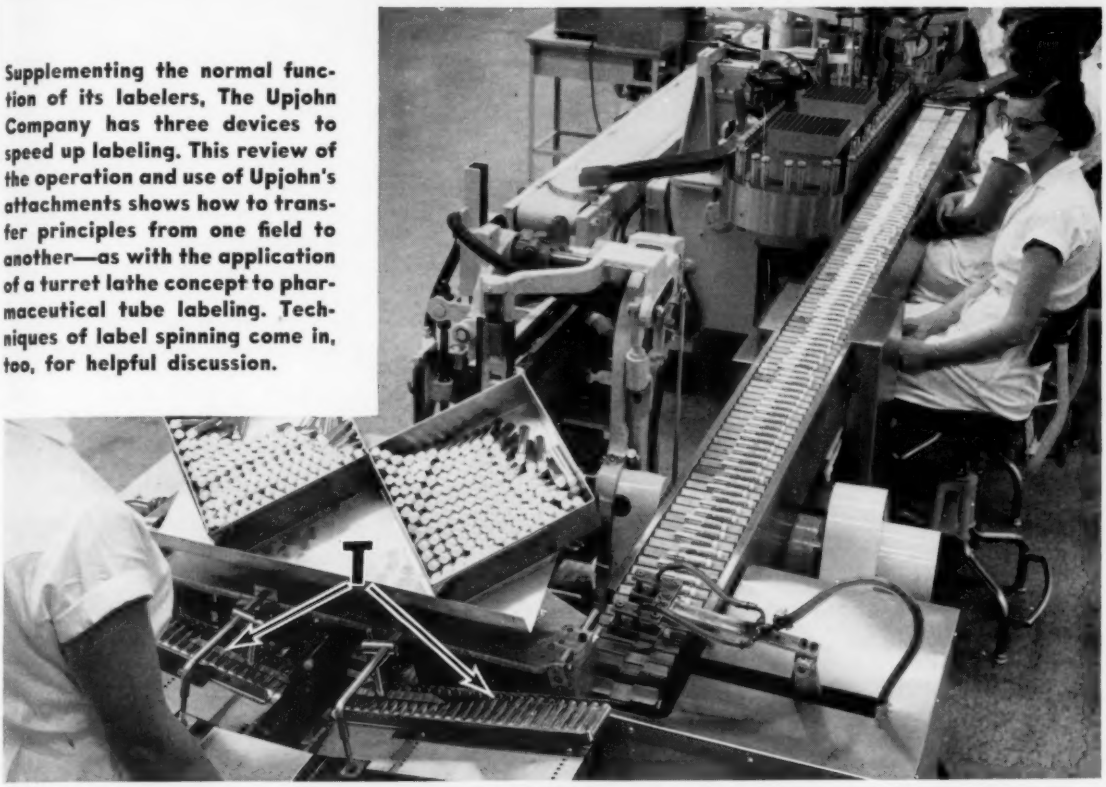
Supplementing the normal function of its labelers, The Upjohn Company has three devices to speed up labeling. This review of the operation and use of Upjohn's attachments shows how to transfer principles from one field to another—as with the application of a turret lathe concept to pharmaceutical tube labeling. Techniques of label spinning come in, too, for helpful discussion.



1 AT START OF OPERATION, attendant feeds tubes to slightly slanted trays (T) on which tubes roll to positions opposite turret mandrels, ready for labeling. After labeling, tubes discharge to conveyor, at right, moving through filling, closing, cartoning and casing.

Rolling on labels speeds production

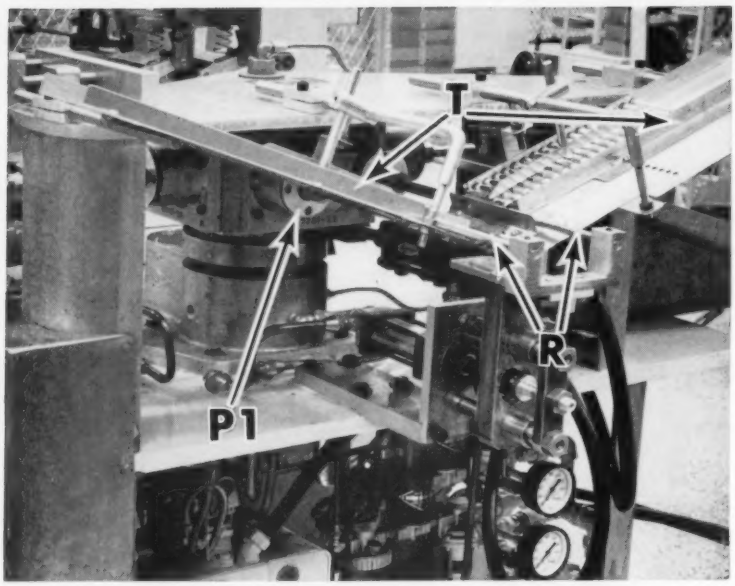
To run its packaging lines faster and more efficiently, The Upjohn Company, Kalamazoo, Michigan, has developed and installed some devices of its own. These various mechanical aids to production usually allow increased speeds with an attendant upgrading of quality and lowering of unit cost, without sacrificing the versatility that is essential to the packaging of short-run pharmaceuticals.

Three of these devices are attachments to labeling machinery to facilitate application of labels to round bottles, tubes, etc. These devices, made in the company's own machine shops, were designed by its staff for use with standard New Jersey labelers.

Took Cue From Turret Lathe

One of the devices is patterned after the turret on a turret lathe, and this device automatically indexes through four operating positions. To apply labels, a mandrel rotates under an idler roll which wraps the label around the tube. Other attachments are somewhat similar in principle, but use powered and idler rolls to hold and spin the bottles during labeling.

The turret device, which holds tubes for the labeler, is permanently attached to the labeling equipment and, incidentally, is fully covered by patent rights. The turret has two mandrels in each of the four operating positions. Two tubes are loaded onto the turret, inspected for caps and proper clos-



2 FRONT VIEW of turret labeler showing position P1-, one of four operating positions. Air-actuated rods (R) push tubes onto mandrels. As soon as two tubes go into place at P1, turret indexes to next position. Meanwhile, tubes are seated and held by vacuum within mandrels. Entire device patterned after turret lathe, automatically indexes through operating positions and is attached to labeler.

ing torque, labeled, and discharged to the packaging line each time the turret indexes through an operating position. Thus, two labeled and inspected tubes move into place in the packaging line with each 90-degree rotation of the turret.

Tubes Go Into Position

Tubes, ranging in capacity from ⅛ oz. to 7½ gm. of various pharmaceuticals, are fed to the turret from slightly slanted trays which hold the tubes and allow them to roll by force of gravity into the correct position for further processing. Workers place the tubes on the trays by hand. (See Figs. 1 and 2.)

When packaging production of a given product begins, the operator places tubes of appropriate size on the trays. Next, the tubes roll to positions opposite the mandrels of the turret. (For simplicity in describing sequence of operations on tubes, turret position is No. 1.)

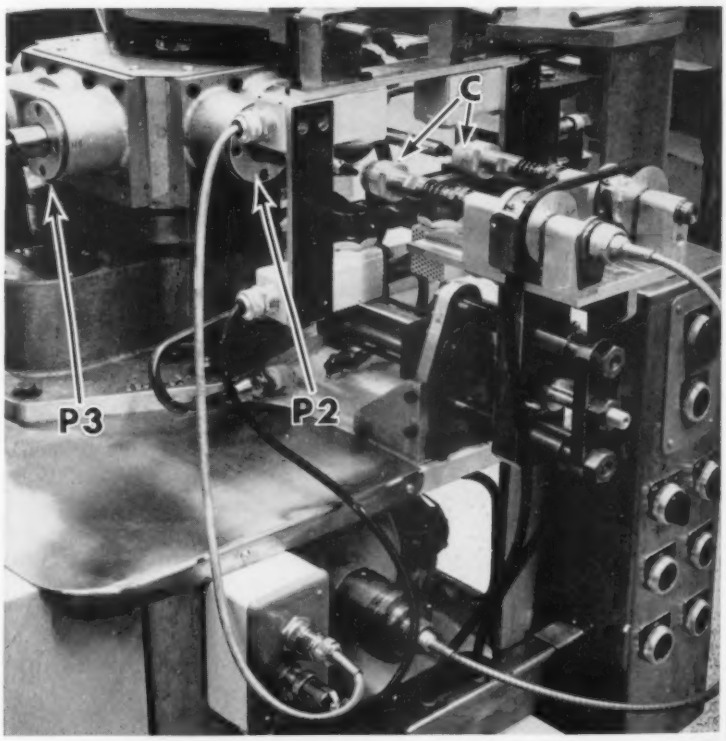
Use Push Rods

Air-actuated rods push the tubes onto the mandrels. (See Fig. 2.) Here, they are seated and held by a vacuum within the mandrels for subsequent operations.

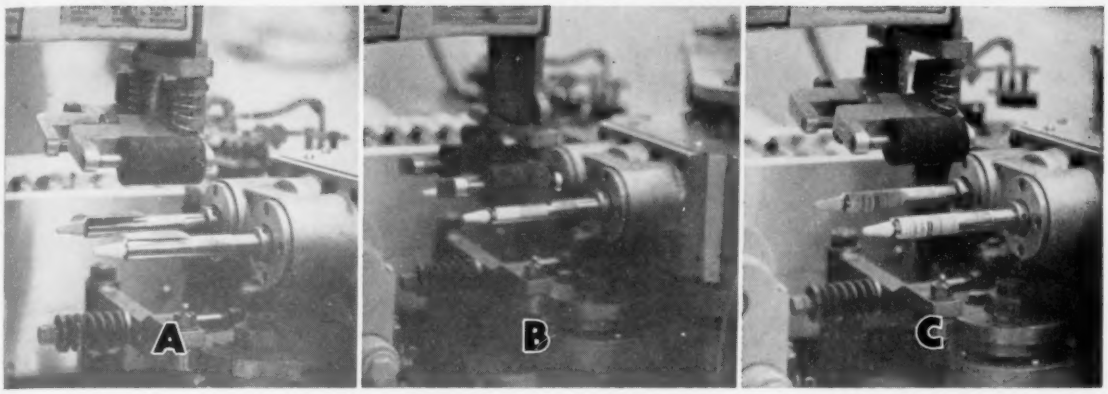
The second operation on the tubes takes place after the turret indexes to the No. 2 position, and at the same time as two more tubes are being placed on the mandrels which have moved into the No. 1 position. The second operation involves checking the mandrel for tubes and tightening the caps down to the proper closing torque. (See Fig. 3.) Lack of a tube or cap activates a memory device through photo-sensitive means to prevent application of a label at the next station.

Spot Defective Tubes

Since extensive remodeling of the label applicators would have to be made to apply a label to only one tube (assuming one was good and one was bad), no label is applied to either of the tubes



3 LEFT SIDE OF TURRET labeler showing cap inspecting stations (C). Second operation involves checking mandrel for tubes and tightening tube caps to correct torque. When turret indexes to third position, tubes receive their labels.



4 AT THIRD POSITION labels (glued on two ends) go on tubes, and soft rubber roll furnishes positive contact between label and tube. (See A and B.) After pause, roll lifts out of way (see C) after which turret indexes to next position. By now, label glue has set.

if one tube is defective. The tubes without labels become, then, immediately obvious to an inspector who removes them from the packaging line before processing.

Labels Go On Tubes

The labels are applied to the tubes after the turret indexes into the No. 3 operating position. As the labels, which are glued on the two ends only, are first applied to the tubes, a soft rubber roll drops into position to assure positive contact between the label and the tube. (See Figs. 4A and 4B.)

The mandrel, after a moment's hesitation to insure that the glue has had time to set sufficiently to prevent label slippage, rotates approximately 370 degrees. The trailing end of the label is then over the leading end and is adhered to the leading end of the label.

Complete The Labeling

After a brief pause, the idler roll lifts up out of the way (see Fig. 4C) and the turret indexes to the No. 4 operating position. (See Fig. 5.) In this position, a vacuum device picks the labeled tubes off the mandrels for the transfer of tubes directly to the packaging line. From here, they go through a typical battery packaging operation (see Fig. 1): filling, closing, cartoning, casing, storage, and, ultimately, movement to the point of sale, and the consumers' hands.

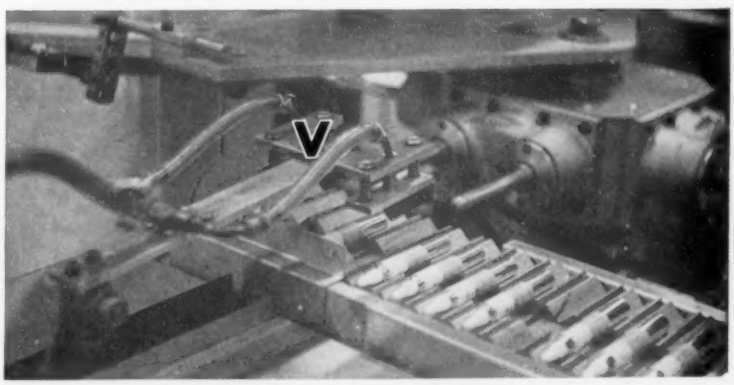
Benefits Of Label Spinning

There are many advantages to using this turret label-spinning operation. Increased production at lower unit cost is, perhaps, the main one. The usual labeling speed for the standard labeling machines in use at Upjohn is 40 to 50 tubes/min. Using the dual mandrels on the four-position turret, the company has doubled production capacity for labeling to 80 to 100 tubes/min., without an increase in speed of the labeling machinery. This allows operating *twice* as fast as before, but without the usual headaches which are incurred when machinery is modified to double the normal production line speed.

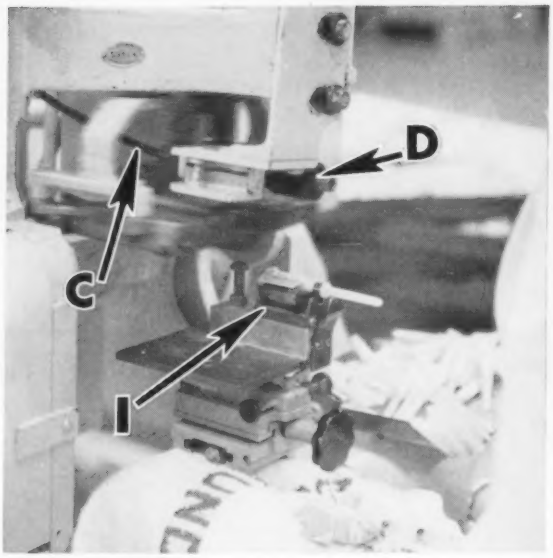
Operator Now Inspects

One of the operators who previously ran one of the labelers (and later supplied labeled tubes to the line) is now a full-time inspector on the line. Another operator now merely supplies tubes to the turret labeler.

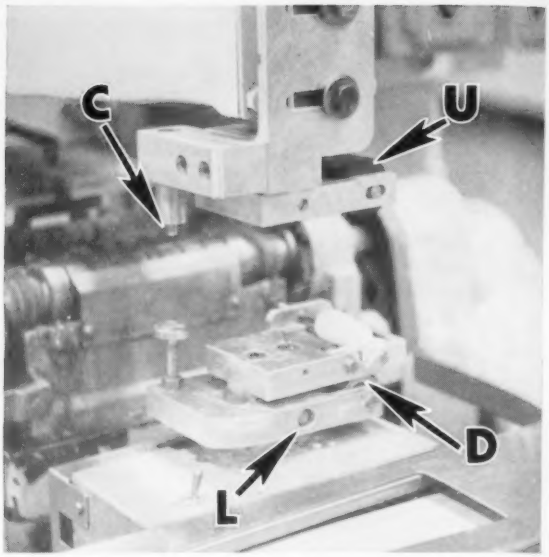
The two jobs are thus made simpler and easier, and the quality of the finished package is upgraded because of the closer inspection. The operators formerly had to pick up tubes, place them on a mandrel to be labeled, pull them off the mandrel, inspect them, and place them into a storage case for future use. *(Turn page)*



5 IN FOURTH OPERATING position, vacuum device (V) picks off labeled tubes from mandrels for transfer of tubes to packaging line as in Fig. 1.



6 ANOTHER METHOD of labeling uses idler rolls (I) and powered driving roll (D) which gets its power through flexible cable (C) from small motor on back of labeler chassis itself. Driving roll (D) is over bottle.



7 THIS VARIATION has non-powered roller (U) over bottle and gets driving force from roller under idler on which bottle rests. Carriage (C) forces lever arm (L) to raise driving roller (D). Contact arm is adjustable.

Labeling To Fit Demand

The company is realizing another saving through gearing the production of labeled tubes to the demands of the product. Formerly, the tubes were labeled *in advance* of filling because the fillers operated faster than skilled operators could supply labeled tubes. Since Upjohn—as does any packaging organization—always wants to make maximum use of its filling equipment, it was necessary to label tubes ahead of the filling schedule and store them in partitioned storage cases.

This system assured the packaging department of having enough tubes delivered fast enough to keep the filling lines operating efficiently. Oftentimes, however, more tubes than were ultimately used had to be labeled to allow for damaged tubes, an oversize batch, etc.

Cased and stored tubes took up valuable floor space. Tubes left over at the end of a run had to be de-labeled and then re-labeled for use with another product, at considerable expense. Now, tubes are labeled *as they are needed*, thus reducing considerably storage costs, idle time, and damaged tube costs.

Labeling Job Now Safer

And finally, but certainly not least in the company's consideration, the tube labeling operation is now much safer for its employees. Previously, the girls who labeled tubes, conceivably could have hurt themselves working so closely with the machinery.

They had to be highly skilled and have nimble fingers to maintain normal production speeds. Now these girls are full-time inspectors of the finished packages; their job is much easier and certainly much safer than when they were running the labeling machinery before the turret labeler was put into operation.

Spin Under Pressure

Another unusual way of applying labels to small, round bottles, vials, sterile syringes, etc., is in use at Upjohn. Workers manually feed the package being labeled to the standard New Jersey labelers. After being labeled, the bottles are removed by hand. A skilled operator places the small bottles (or whatever else happens to need labeling) on two small rollers. The bottle spins under the pressure of other rollers and the label is rolled on. As quickly as the bottle, syringe, etc., is labeled, the operator removes it and places it onto the packaging line for processing.

One variation of this bottle-rolling labeling equipment has two idler rolls under the bottle—the driving (powered) roll is *over* the bottle. (See Fig. 6.) The operator puts the bottle on the idler rolls. The labeling equipment places a label on the bottle, then moves out of the way of the powered roller. This latter roller moves down, rests on the bottle, and spins it around, thus wrapping the label around the bottle.

Use Small Motor

The powered roller is driven by a small motor on the back of the labeler chassis, through a small, flexible cable (see Fig. 6) much like that used to drive an automobile speedometer.

The other variation of this equip-

(Continued on page 72)

By **Helen M. Goerig,**
Research Chemist,
Container Research & Development,
Kaiser Aluminum & Chemical Sales, Inc.,
Chicago

Getting the right aluminum container for a particular food product requires (1) knowing how compatible the product is with aluminum, (2) knowing when to use a protective coating, and (3) having a background of tests on which to base decisions. It helps also to understand how the principles of corrosion relate to aluminum—all geared at assuring product-package compatibility. Mrs. Goerig not only offers some helpful hints in choosing the correct alloy of aluminum, but also presents a summary of package testing for various time intervals. Her observations cover a sufficiently wide range of specific food items to make her findings of general interest to anyone seeking corrosion-free packaging for foods.

Corrosion need not mar your food package

Correctly choosing an aluminum alloy—with or without protective coating—assures food/container compatibility

From a packaging point of view, container corrosion can have detrimental effects on appearance and acceptability of packaged food products. Many laboratory and field investigations have demonstrated that proper choice and preparation of aluminum is necessary in order to exploit its advantages for packaging purposes from both a cost and corrosion standpoint.

PRINCIPLES OF CORROSION

A brief review of the principles of corrosion as they apply to aluminum will show some of the reasons for the high corrosion resistance of aluminum. The corrosion reactions which may lead to loss of mechanical properties under some adverse circumstances, as well as penetration, may be thought of as a reverse of the process by which the metal is obtained from the ore.

Oxide Forms On Surface

Thus, oxygen from the air or from oxygen-containing chemicals, including such common substances as water, may react with the metal surface to form a film of oxide on the surface. With some metals, such as iron, the surface oxide film readily permeates the reactive material, and the reaction will continue in many cases to complete destruction of the metal.

However, the initial oxide film produced on the surface of aluminum alloys is so compact and impermeable that it acts as a protective film and prevents further reaction between the environment and the aluminum. This stifling of further reaction by a protective oxide film is responsible for the inherent resistance of aluminum to corrosion.

But our discussion of corrosion reactions above should not suggest that a reaction occurs *directly* between the oxidizing agent in the environment, e.g. O_2, and the metal surface. There is much evidence that the corrosion reaction is actually an *indirect* reaction in which portions of the overall reaction occur at different areas of the surface. It is possible under some conditions, e.g. temperatures near 200°F., for de-aerated water to cause continuing oxidation of aluminum, but an oxidizing agent such as O_2 is generally needed.

The Total Reaction

In terms of the electrochemical theory of corrosion, a hydrated aluminum oxide, or hydroxide, forms over some areas of the metal surface while oxygen gas is reduced to hydroxyl ion at another portion of the surface. To show this, it is necessary to write the total reaction,

$$4Al + 6H_2O + 3O_2 \rightarrow 4Al(OH)_3 \quad (1)$$

in terms of the two half reactions,

Helen M. Goerig received her B.S. degree from Seattle University. In 1952 she joined Kaiser Aluminum's department of metallurgical research in Spokane, Washington. In the past eight years she has done extensive research to determine the suitability of aluminum foil for packaging foodstuffs. As research chemist, she was later transferred to the company's container research & development laboratory in Chicago, where she continued her research project. She is a member of the American Chemical Society and the American Society for Metals.

TABLE I

Results Of Fresh Food Storage Tests At 0°F. In Bare And Coated Aluminum Foil Containers*

Foods	3 Months		6 Months		12 Months		Total	
	Bare	Coated	Bare	Coated	Bare	Coated	Bare	Coated
Apples	---	---	---	---	---	---	-	-
Beans, green	---	---	---	---	---	---	-	-
Broccoli	---	---	---	---	---	---	-	-
Brussels sprouts	---	---	---	---	---	---	-	-
Carrots	---	---	---	---	---	---	-	-
Cauliflower	---	---	---	---	---	---	-	-
Celery	---	---	---	---	---	---	-	-
Cherries, pie	---	---	-x-	-x-	---	---	1	1‡
Corn	---	---	---	---	---	---	-	-
Cranberries	---	---	---	---	---	---	-	-
Cream, whipping	---	---	---	---	---	---	-	-
Cream, whipped	---	---	---	---	---	---	-	-
Grapefruit	---	---	---	---	---	---	-	-
Mayonnaise	xxx	---	xxx	-x-	xxx	xxx	9	4
Mushrooms	xxx	---	xxx	---	xxx	---	9	-
Onions	---	---	---	---	---	---	-	-
Oranges	---	---	---	---	---	---	-	-
Peaches	---	---	---	---	---	---	-	-
Pears	xxx†	---	-xx	---	---	---	5	-
Peas	---	---	-x-	---	---	---	1	-
Pineapple	-x-	---	---	---	-x-	---	2	-
Raspberries	---	---	---	---	-x-	---	1	-
Rhubarb	---	---	---	---	---	---	-	-
Salad dressing	-xx	---	-x-	-xx	-xx	-xx	5	4
Spinach	---	---	---	---	---	---	-	-
Strawberries	-xx	---	-x-	---	-xx	---	5	-
Tomatoes	---	---	---	---	---	---	-	-
Watermelon	---	---	---	---	---	---	-	-

*For each food, 3 containers were employed for each period and condition of test. Hence, 9 bare and 9 coated containers were tested in contact with each foodstuff. Each "x" indicates a perforated container. Each "-" indicates a container that did not perforate.

Containers are 5x4x1½x0.0035 in., fabricated from No. 3003 foil.

†The pears stored for 3 and 6 mo. were soaked in salt water to inhibit discoloration. These containers perforated. The pears stored for 1 yr. were not treated in salt water and did not perforate their containers; however, the pears were discolored and did not appear edible.

‡Perforation of this container is believed to result from some cause unrelated to pie cherries, such as a pinhole in the coating or a minute break in the container.

TABLE II

Results Of Commercially Canned Food Storage Test At 40°F. In Bare And Coated Aluminum Foil Containers For 1, 2, and 4 Weeks*

Foods	1 Week		2 Weeks		4 Weeks		Total	
	Bare	Coated	Bare	Coated	Bare	Coated	Bare	Coated
Applesauce	-xx	---	---	---	-xx	---	4	-
Asparagus	---	---	---	---	---	---	-	-
Beans, green	---	---	-x-	---	-x-	---	2	-
Beans, Lima	---	---	---	---	---	---	-	-
Carrots	---	---	---	---	---	---	-	-
Cherries, sweet	---	---	---	---	---	--x†	-	-†
Corn	---	---	---	---	---	---	-	-
Cranberry sauce	-xx	---	xxx	---	xxx	---	8	-
Grapefruit	---	---	---	---	---	-x-†	-	-†
Peaches	-xx	---	xxx	---	xxx	---	8	-
Pears	xxx	---	xxx	---	xxx	---	9	-
Peas	---	---	---	---	---	---	-	-
Pineapple	---	---	-x-	---	xxx	-xx†	4	-†
Potatoes	---	---	---	---	---	---	-	-
Raspberries	---	---	xxx	---	xxx	---	6	-
Spinach	---	---	---	---	---	---	-	-
Strawberries	---	---	---	---	xxx	--	3	-
Tomatoes	---	---	---	---	---	---	-	-

*For each food, 3 containers in each condition were employed for each test period. Hence, a total of 9 bare and 9 coated containers were tested in contact with each food. Each "x" indicates a perforated container. Each "-" indicates a container that did not perforate.

Containers are 5x4x1½x0.0035 in., fabricated from 3003 foil.

†One carton containing cherries, one containing grapefruit, and two containing pineapple were perforated after 4 wk. storage. However, check tests with sextuplet samples were not perforated after storage for 4 wk. at 40°F. Perforations in the original tests are believed to a result of external contact of outer bare surface with juices from other failed containers.

$$4Al \rightarrow 4Al^{+++} + 12 \text{ electrons} \quad (2)$$

and

$$3O_2 + 6H_2O + 12 \text{ electrons} = 12(OH)^- \quad (3)$$

which occur at separate portions of the surface. Combining the half reactions, with the reaction between aluminum ion and the hydroxyl ion to form hydrated aluminum oxide in the reaction,

$$4Al^{+++} + 12OH^- = 4Al(OH)_3^* \quad (4)$$

we obtain an over-all reduction as shown in Equation 1. On this basis, we can explain the high corrosion resistance of aluminum as resulting from the fact that the oxide films formed on aluminum surfaces retard or prevent the half reactions.

Effect Of Alloying Elements

In most environments, the major effect of the oxide film already present is to stifle the reaction in which aluminum becomes ionized. The net result is that the presence of the oxide film on all aluminum alloy surfaces retards the over-all corrosion reaction. The addition of some other metals as alloying elements to aluminum decreases the protective character of aluminum oxide, and thereby decreases the over-all corrosion resistance of the alloys.

Thus, the protection against further reaction provided by the oxide film on alloys such as Alloy 2024 is decreased by the presence of copper oxide in the film. For this reason, Alloy 2024 is not generally used in corrosive environments without protection. On the other hand, alloy additions such as manganese and magnesium do not significantly influence the protective nature of the oxide film.

PERFORMANCE TESTS

A number of corrosion problems followed the advent of frozen dinners and entrees on the market in recent years. We made a number

*$Al(OH)_3$ may be written as $Al_2O_3 \cdot 3H_2O$. These two forms are not distinguishable experimentally and are really two ways of writing the same compound. $Al_2O_3 \cdot 3H_2O$ is the high-temperature corrosion product.

TABLE III*

The pH Values Of Various Classes Of Foods

Class of Food Products	pH Range	Authority
Fresh fruit	2.8 to 4.7	Friese
Canned fruits (English)	2.7 to 4.3	Adam
Canned fruits (imported)	2.7 to 5.0	American Can Co. Res. Dept.
Canned vegetables (English)	5.0 to 6.3	Adam
Canned vegetables (imported)	3.5 to 7.5 (sauerkraut) (hominy)	American Can Co. Res. Dept.
Fresh meat	5.2 to 6.4	Callow
Fresh milk (normal)	6.4 to 6.8	Davies
Evaporated milk (canned)	5.9 to 6.3	American Can Co. Res. Dept.
Canned cheese	4.7 to 5.6	American Can Co. Res. Dept.
Fish (haddock)	6.5 to 7.0	Macpherson
Canned fish (imported)	5.9 to 7.4	American Can Co. Res. Dept.

*Adapted from the British publication, Aluminum and Aluminum Alloys in the Food Industry, Department of Scientific and Industrial Research, Food Investigation, Special Report No. 50, by J.M. Bryan, 1948.

of evaluations to determine the following:

1. To compare corrosion resistance of various bare alloys to be used as rigid foil containers for storage of frozen foods;
2. To evaluate performance of coated foil containers during storage of frozen foods;
3. To make a compilation of foods which can be satisfactorily packaged in bare foil containers;
4. To make a similar compilation of foods which require coated containers;
5. To determine the storage life which can be expected from certain containers in specific applications.

To determine the basic suitability of bare and coated containers with all types of foodstuffs, we initiated storage tests employing various fruits and vegetables.

Test I. Fresh fruits and vegetables were packaged in bare and coated Alloy 3003 containers and stored at 0°F. for 1 yr. The foods selected for testing were commonly used fruits and vegetables representative of several food families, and were of the highest quality and the freshest available.

No Additives Used

They were prepared and frozen in accordance with accepted home economics procedures (i.e., washing, blanching, peeling, etc.) with the exception that no additives such as condiments, sugar, preservatives or ascorbic acid were added during preparation or storage.

No additives were used because a search of *Chemical Abstracts* and *Metallurgical Abstracts* failed to uncover any literature containing significant data on corrosion performance of foods during storage in aluminum foil at freezing temperatures.

We believed that additions of varying concentrations of such things as salt and ascorbic acid would not give us a true picture of each food per se. Therefore, we eliminated the variables of additives and were concerned with each food alone.

In addition, cream, salad dressing, and mayonnaise were included in the test.

Results showed containers to be satisfactory with all foods tested except salad dressing and mayonnaise.

Unprotected aluminum foil containers were satisfactory with:

apples
green beans
broccoli
Brussels sprouts
carrots
cauliflower
celery
cranberries (whole)
cream, whipping
grapefruit
onions
oranges
peaches
rhubarb
spinach
tomatoes
watermelon
corn

We had been advised, and observed, that a number of tomato products, sauces, gravies and the like had at times perforated the aluminum containers. It was found in this test that tomatoes, picked at the peak of ripeness, blanched, peeled, quartered, and frozen had no detrimental effect on the foil containers. Coated foil containers should be used as container materials for the following products when not accompanied by additives such as condiments, sugar, preservatives, or ascorbic acid:

mushrooms
pears†
peas‡
pie cherries
pineapple
raspberries
strawberries

These food products without additives, perforated bare containers. Salad dressing and mayonnaise should not be packaged and stored in bare or some types of coated aluminum containers. However, these foods do not appear edible after storage at freezing temperatures. Table I contains results in detail and shelf life.

Test II. Tests were conducted with commercially canned fruits and vegetables, purchased from a

TABLE IV

Comparison Of Corrosion Performance Of Bare Alloy 3003 Versus Alloy 1145 When Packaged With Corrosive Foods and Stored At 15°F. For 6 Months

Food	Corrosion Resulting In Perforations (most resistant)	Staining (most resistant)	Etching (most resistant)
Apricots	3003	-*	-
Artichokes	3003	-	-
Avocado	1145	3003	Equivalent
Blackberries	-	3003	-
Blueberries	Equivalent	-	-
Cherries, pie	-	Equivalent	Equivalent
Corn	-	1145	-
Huckleberries	Equivalent	-	-
Mushrooms	1145	1145	-
Pineapple	3003	3003	3003
Plums	1145	-	-
Prunes	1145	-	-

*Hyphen (-) signifies no adverse effect as specified in heading.

TABLE V

Results Of Tests With Fresh Vegetables And Fruits Packaged In Accordance With Accepted Commercial Procedures, Using Preservatives And Condiments When Specified, In Uncoated Bare Alloys 1145 and 3003, and Coated Alloy 3003 Aluminum Containers*

Food	Container Alloy	Number Of Perforations In Containers Stored At 0°F. For Time Shown† — Months												Number Of Perforations In Containers Stored At 15°F. For Time Shown‡ — Weeks						Months			
		1	2	3	4	5	6	7	8	9	10	11	12	2	4	6	8	10	12	3	4	5	6
Vegetables:																							
Artichokes	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Asparagus	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beans, green	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broccoli	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brussels sprouts	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corn	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eggplant	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mushrooms	3003	-	-	-	-	-	-	-	-	-	2			-	-	-	1	1	1	1	4 Removed		
	Coated	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-			-	-	-	1	1	1	1	1	1	2
Peas	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fruits and berries																							
Apricots	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1
Avocado	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackberries	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blueberries	3003	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	4 Removed from test						
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4 Removed from test						
Cantaloupe	3003	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
Cherries, pie	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grapefruit	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Huckleberries	3003						3	5	5	5	5	6 Removed		-	4 Removed from test								
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145									2	3	4	4	-	4 Removed from test								
Nectarines	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oranges	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peaches	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pears	3003									1	1	1	1‡	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145													-	-	-	-	-	-	-	-	-	-
Pineapple	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	4 Removed	
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	4 Removed		
Plums	3003	-	-	-	-	-	-	-	-	-	-			-	-	-	-	4 Removed from test					
	Coated	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
Prunes	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1¶
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Raspberries	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhubarb	3003	-	-	-	-	-	-	-	-	-	-	-	-										
	Coated	-	-	-	-	-	-	-	-	-	-	-	-										
	1145	-	-	-	-	-	-	-	-	-	-	-	-										
Strawberries	3003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tomatoes	3003	-	-	-	-	-	-	-	-	-	2			-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
Watermelon	3003	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	Coated	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
	1145	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-

*Container size: 5½x4½x1½x0.0035 in. gauge. A "-" indicates no perforations of container. Samples of each variable were removed from test when all samples in its group had failed (perforated). In cases where there is neither a "-" nor a number, it indicates that samples were removed from test before the test period was completed, because of equipment failure.

†Each number for the samples stored at 0°F. indicates the number of test containers perforated out of six.

‡Each number for the samples stored at 15°F. indicates the number of test containers perforated out of four.

‡The perforation noted in one container was a minute pinhole. The corrosion did not progress during the ensuing 3 mo. and is not considered significant.

¶Pinhole in size, not considered significant.

(Continued on Page 73)

Just Between You and Your Customer

Customer loyalty is your most valuable business asset. One of the custodians of this loyalty is your package, and the product protection it provides.

Here's where Riegel can help, through research, development and manufacture of packaging materials . . . tailor-made for your product . . . with equal emphasis on protection, low cost, high packaging speed and attractive appearance. More than 600 different materials to choose from . . . papers, paperboards, foils, films and combinations . . . waxed, coated, printed and plain . . . tailor-made or standard.

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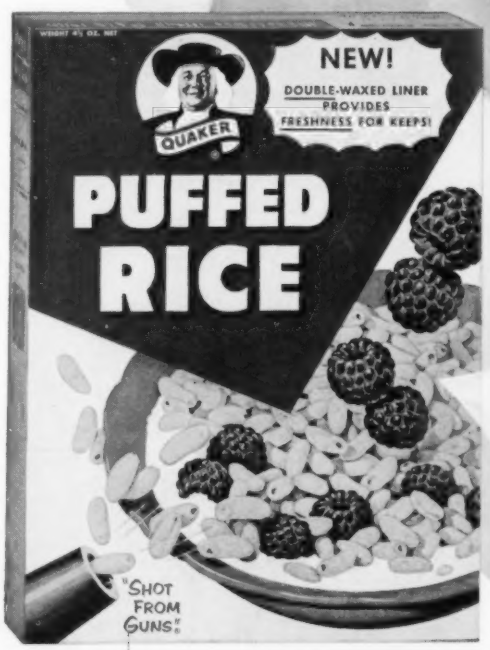


Quaker Puffed Rice is protected with a special Riegel laminated and over-waxed Cereal Liner. Run at high-speed on Pneumatic Scale equipment.

Riegel

PROTECTIVE PACKAGING MATERIALS

Stressing the importance of layout to successful packaging, an engineering expert in a nationally known company offers helpful experience and opinion with special reference to (1) minimum investment, (2) minimum handling, (3) minimum labor, (4) maximum protection and (5) maximum flexibility. Further, his practical pointers and review of pros and cons of layout alternatives, deserve careful attention.

Effective layouts for today and tomorrow

You start by designing a new package. You find that the new design requires new equipment in your factory. Perhaps, all this is for a new product or a new package on an existing one—in any case, it catches fire with the public and sales soar. Suddenly, you discover that you need more manufacturing space—even a new factory. Yes, to design a new package is often, by implication, to design the need for a new packaging operation, perhaps a new building.

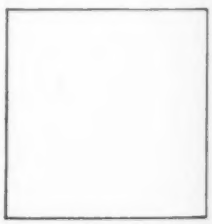
Even assuming that these things may arise from a new design, does that mean these are any concern of the packaging engineer? Yes, they are. Look at it this way: Success of a package depends greatly on its appeal and utility to the customer. Price is part of this appeal, and the packaging cost is part (often too large a part) of the price. Hence, cost cannot be ignored in designing a package.

This cost means not only that of the container materials themselves, but also of all the labor, equipment, and space necessary to use those materials. Successful package engineering goes far beyond the package. It extends a long, inquisitive probe into every cranny of packaging costs.

Layout Is Vital

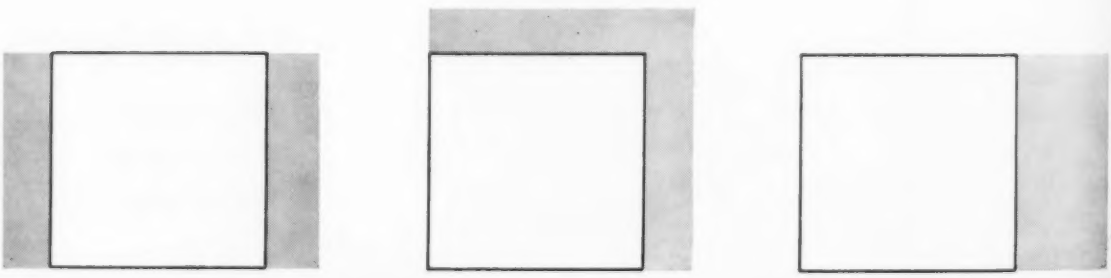
The layout of packaging operations bears heavily on such costs. Often, the live-or-die decision on a new package depends on the money needed to set up to run. The difference between profit and loss on a package may lie in layout.

160 x 40 ft.

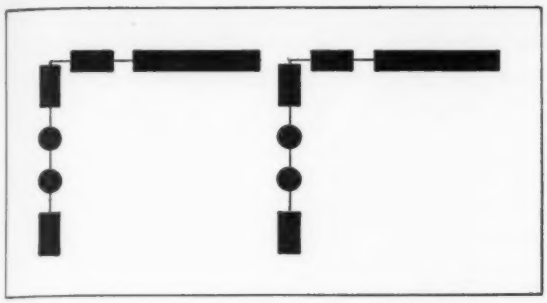


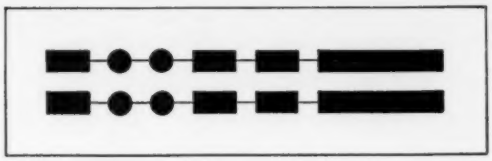
80 x 80 ft.

1 BOTH PLANS have 6400 sq. ft., but one above has 400 ft. of wall to be built and maintained, while one at right has only 320 ft. Also, it has fewer structural columns.

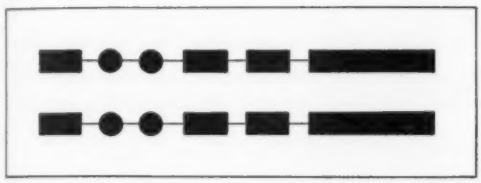


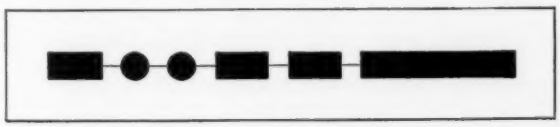
2 PLAN YOUR LAYOUT so it will fit future expansion. Going from left to right, future expansion areas (shaded) use fewer feet of added perimeter wall per square foot of added floor space.





3 BOTH LAYOUTS use same machines, of same size. Note wasted space in one at left. Chances are it will soon be full of surplus cases, in-process materials, and whatever else spoils appearance of factory.





4 SECOND SLOW-SPEED line at left costs little—before figuring in cost of space and labor it requires. If company is expanding, high-speed machines may be cheaper than new construction.

Layout decides how much building you need, what you can get out of equipment, what your labor costs are, how you protect against product losses, how quickly you can meet delivery schedules, and how adaptable you are to changes.

You just cannot ignore the importance of layout. It looms behind every packaging decision. And meeting its problems squarely demands that you keep certain objectives in mind. These are:

1. **Minimum investment**
2. **Minimum handling**
3. **Minimum labor**
4. **Maximum protection**
5. **Maximum flexibility**

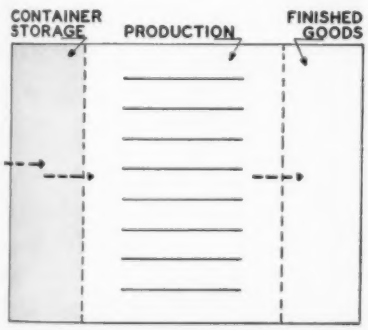
Let's take a closer look at these.

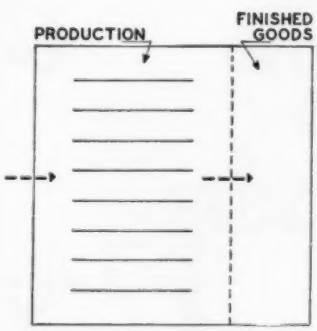
1. MINIMUM INVESTMENT

Investment means a lot. Ask your financial officer. The more money you tie up in buildings, materials, and equipment, the less working capital there is with which to run the business. With money rates the way they are, you can be sure he doesn't want to borrow any more than he has to. It is obvious that the more you invest, the greater are the overhead charges against your package.

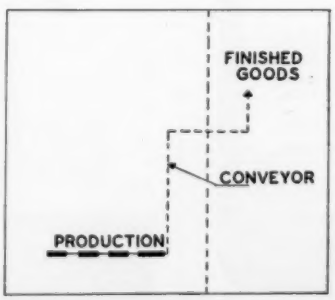
Buildings

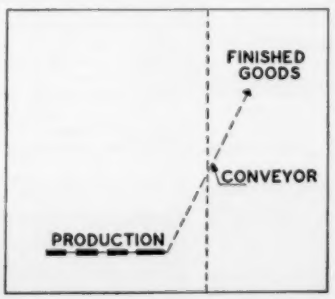
Layout-wise, the biggest factor in building costs is the shape. Layout does not have much effect on unit costs of floor or roof, but look what it can do to walls. The two





5 Above: **ARROWS POINTING** to right show flow of containers. Space in layout for empty container storage may be unnecessary, or means double handling. Compare space, handling, in both arrangements.





6 At right: **BROKEN LINE** shows conveyor from end of packaging line to finished goods storage spot. Conveyor on left follows walls and columns; one on right takes same trip more directly.

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buildings in Fig. 1 have the same floor and roof area, but the first was laid out for a long, narrow floor. It has 25 per cent more walls than the second. This not only means more cost to build, but also more continuing cost to maintain. A square plan, if you can fit a layout to it, is always better.

When you plan a layout, you ought to give some thought to future expansion, too. Some day you will be adding more production lines and, probably, more warehouse space. Where and how? You would like to do this without moving the equipment already installed. Therefore, you spot your equipment and storage now so that future building additions can be made at least cost. For example, see Fig. 2.

In the first illustration, the planners figured that future expansion would be at both ends of the building. Production at one end, storage at the other. The ratio of added wall perimeter to added floor area is 1.5. In the second picture, a different plan for the future permitted a ratio of only 1.45. In the third, the ratio is still less (1.0), and the building investment is kept as low as possible. If you follow this last scheme, your good planning today will minimize your added costs tomorrow.

Use What You Have

But there is more you can do, and it means as much to the economical use of present buildings as to the construction of new ones. In fact, many companies cannot afford the luxury of new buildings. The money just isn't there; or the time. We have to make do with what we have.

This is a very real problem for many companies: How to get more production through existing structures. The population explosion has hit manufacturing. And, there is just as much of a housing shortage for machines as for people. Keep this in mind.

You will make the best use of your space if you note how packag-

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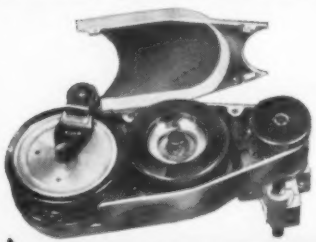
with minimum maintenance



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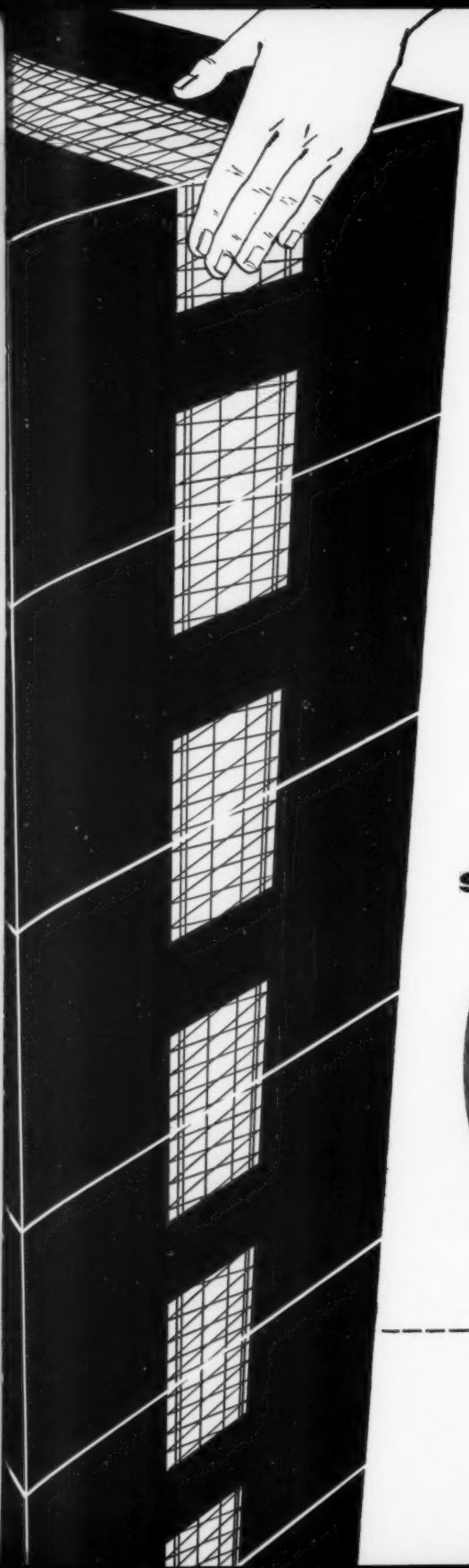

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Faster - Stronger - Costs Less

If you're still sealing cases with staples, wire stitching or 6 strips of plain paper tape, you owe it to yourself to investigate 2-strip sealing with reinforced tape.

If you're now using staples or wire stitching, the Ludlow Method offers you:

- Up to 60 more cases sealed per hour.
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Both SNAKETAPE and GLASPUN are approved for shipment on all carriers under U. F. C. Rule 41.

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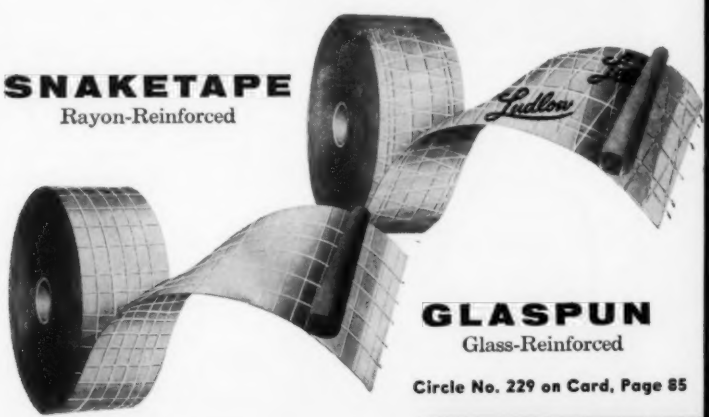

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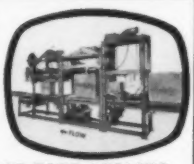

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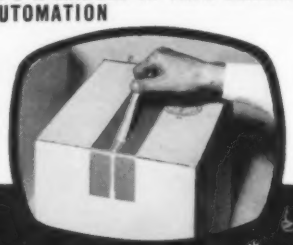

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These glued or stapled cases must be torn or cut open. It's not easy, it's dangerous to persons and contents. It also wrecks the box. You don't win much customer good-will this way.

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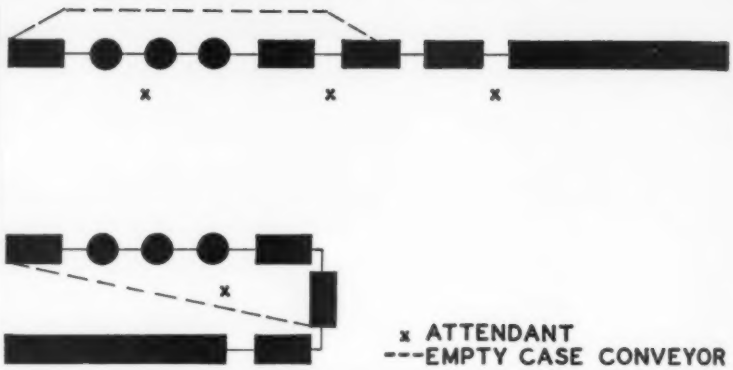

7 STRAIGHT-LINE LAYOUT at top has many advantages, but often factories have U-shaped lines, shown below. Latter puts machines more readily accessible to attendants, mechanics, inspectors; ties in well with centralized storage areas.

ing lines are laid out. Fig. 3 shows two layouts. In the first, it seemed natural to the plant engineer to lay out his lines in an "L" so that they followed the flow of cases from his machines. In the second, the machines were rearranged so that straight lines resulted. Both layouts have their good points, but notice how the second one eliminates wasted floor space.

There is a lot more you can do with equipment to reduce building investment or to get more out of your present buildings. Let's take it up under a separate heading:

Equipment

A crucial dilemma in equipment selection is high-speed versus slow-speed. This affects your investment and layout and, hence, your packaging costs. It comes up whether you are thinking of a single unit, like a steel-strapping machine, or a complete sequence of related pieces, say, a brewery bottling line.

Typically, your company decides to bring out a new product. The demand is going to be limited at first, and until its magnitude is known, you want to hold down the investment risk. You install slow-speed equipment. That is a logical decision.

Now your product succeeds. You cannot keep your warehouse full and it begins to suffer hunger cramps. The sales department is roaring for more production. You go to double shift and up go your operating costs. The answer? New equipment.

Slow- Or High-Speed Line?

Here is the problem for you and many others in your position. Should you put in another line like the first, thus doubling your output at the least added investment, or should you replace with high-speed equipment? A lot may be said for each choice. Remember that most manufacturers of high-speed machines sell slow-speed ones as well.

Cost of equipment, of course, hits you first. It is obvious that a fast line will tie up more of your treasurer's dollars than a slow one. But, let us look further. What about space requirements? Two lines usually take more room than one. Fig. 4 shows why. You just don't need as much building if you can get out production with half as much equipment. That is why many plant managers believe that hiking the through-put by speeding up their lines is as good as building a larger factory. High-speed equipment may really take less investment in the long run. And your layout shows why this is so.

Investment is not the only consideration, however. There is also

the matter of operating labor. Two lines may need twice as much personnel as one. We say "may" because this again depends on your layout. If you have a good one, you may find that a single crew can act as attendants on both lines. In this way, careful layout minimizes your operating cost.

Using Multiple Lines

Aside from investment and crew size, many engineers still like the idea of multiple slow-speed lines for another reason. "If you've got all your production tied up in one line," they say, "and it has a breakdown, you're out of business until it's fixed. With slow lines, one can go down, but the others still keep on feeding production to the warehouse."

Carried to its extreme, this argument could justify getting rid of all equipment and doing everything by hand. But, in a limited way, it does make some sense.

The high-speed enthusiasts point out, though, that modern machine builders give a lot of thought to designing for trouble-free performance. And the preventive maintenance programs do still more to chase this breakdown bugaboo.

Machine Versatility

Another way to minimize equipment investment is to use more versatile machines. You can have many machines, each set for a particular job, or you can have a few versatile ones. More and more of the manufacturers are stressing such features as quick-changeover or complete adaptability. A typical example is a case-sealing unit that adjusts itself to take, within limits, any size case that comes to it. A labeling machine features a hand crank that quickly sets it for various bottle heights. An automatic palletizer can adapt in an instant from the pallet pattern for one size case to that for another.

Again, let us emphasize that we are talking in this section about investment. Flexible equipment *seems* to cost more, but it is cheaper than a battery of special purpose

Food packagers . . .

Patapar® offers a full range of F.D.A. Accepted wrappers and liners.

All food packagers affected by the 1958 Food Additives Amendment to the Federal Food, Drug and Cosmetic Act will find it easier to achieve F.D.A. Accepted packaging by using Patapar. While Government scrutiny of food packaging grows more intense, Plain Patapar Vegetable Parchment can still offer absolute purity. *That's because there aren't any additives in Plain Patapar.* This Vegetable Parchment is a dense, fiber-free cellulose . . . whose *natural* qualities are purity, wet strength, grease and moisture resistance, good separation characteristics, and remarkable toughness. Furthermore, these qualities can be provided in varying degrees according to need.

Paterson will be glad to help you select the type Patapar which best suits your requirements. Code numbers and the corresponding characteristics of the Patapar vegetable parchments on the F.D.A. Accepted list fill up too much space to list here. If you would like specific information, simply fill out and mail the coupon for a sample package.

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This Hayssen Wrapper allowed Top Flight Paper Products, Inc. of Chattanooga, Tenn. to increase its packaging production by 700% according to Mr. Montgomery Robinson, Vice President, Sales. Present production is 1,500 packages per hour as compared to the 180 average rate of the older system. Purchased to operate a mere 16 hours a week, the greater demand for the new poly package increased machine use to 120 hours.

HAYSSEN – WRAPPED poly packages give your customers these important advantages

■ **LONGER SHELF LIFE**

Polyethylene lasts longer, protects longer than any other low cost transparent wrapping material. Keeps products fresh and clean indefinitely.

■ **TAMPER-PROOF PACKAGES**

Sheets cannot be removed without destroying package. Hayssen wrapped poly-paks are sealed on all sides.

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Neat, clean Hayssen-formed packages sell fast, gain customer confidence in product.

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machines taking turns at your production schedule. And it takes less space. **There seems to be a sort of Malthus' Law in manufacturing: production demands outrun building capacities.**

Space Saving Vital

The packaging field teems witl ideas to save space. Short case sealers are widely featured. Going a step further, you can up-end your operation with a vertical case unit if you want to use overhead cube. Triple-decked machines such as an uncaser receive cases on one level and discharge cases and contents on two others. Assembly machines, such as a carry-pack unit, perform their function primarily in the vertical plane. An automatic low-vacuum detector can be set in the line in less space than would be needed by a human inspector.

Still another way to shrink your operations to fit your building is to close-couple your machines. Not too long ago, lengthy conveyors between machines were considered good protection. If a machine stopped momentarily, containers could accumulate in a "float" or "reservoir" on the line without shutting everything down.

This venerable belief is now going the way of the cracker barrel. It just doesn't fit in with volume operation. A half-minute's float in the old days might mean 30 containers. Now, it may build up to over 300, and taking care of it may demand incredible conveyor and floor space. Close-coupled machines with a common drive are more and more the trend. If they weren't, our factories would be outgrowing our cities.

Materials

Forward planning of your packaging materials is another way to reduce investment. And, when you reduce your investment in material stocks, you reduce investment in the building cube needed to hold them. In this way, economies in material stocks step in the back door to simplify layout.

(Turn page)

For more information circle No. 232 on Reader Service Card, Page 85

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YOU'VE GOT A SAFE BET WITH CELLOPHANE

Did you know that one standard roll of Olin Cellophane 9½″ OD will give you almost one mile of risk-free packaging material? For example, cellophane can be sealed at a wide range of temperatures, (roughly from 350° to 500°) and still assure strong, positive heat seals. In addition, its uniformity of gauge runs about plus or minus 5% which further guarantees consistency of heat seals. What does this mean to you? Fewer headaches, greater packaging efficiency and lower packaging production costs. Check around. You'll find that no other flexible packaging material can come close to cellophane's trouble-free packaging production record. Call in an Olin Cellophane representative or converter today.

Olin CELLOPHANE

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Automate your marking... dating... coding with the WHIPPET®

Mounted on your conveyor, WHIPPET *imprints* passing cartons, neatly, without smearing. Fully automatic, self-inking, needs no operator. Printing drum adjusts for perfect registration throughout full 360°. Ends costly repair bills, usual with inferior equipment. Write today for further information to Dept. PE

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For example, consider the warehouse space required to hold reserve supplies of unfilled containers. If you have 50 different sizes of cartons, you'll need 50 different piles in that warehouse. But, if package design can simplify and standardize your variety, you can whittle investment from both ends.

Another way to accomplish the same result is to carry a standard line of single-sized containers, with no product marking, then imprint the product name at the time of use. You can do this with a case imprinter that costs a lot less than the investment in unfilled case inventory that it saves. Label printers accomplish a similar purpose.

2. MINIMUM HANDLING

Getting back to the objectives listed at the beginning of this article, consider a layout that minimizes handling. Such a layout will also reduce labor cost, handling equipment cost, and—important in the packaging field—product damage. Examples of tricks in this trade are boundless. Here are a few typical ones that are often overlooked.

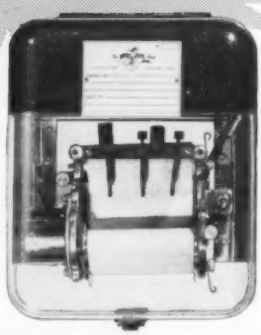
We mentioned before the desirability of reducing stocks of unfilled containers. But, why not eliminate them altogether? In the first half of Fig. 5, empty containers are taken from the receiving dock to storage, then from storage to the production department. In the second half, they are unloaded and delivered directly to the point of use. This takes careful scheduling. But, this is better than setting everything down and then picking it up again. Good planning, added to a well-conceived layout does contribute to handling economies.

Conveyors are often a first thought when it comes to handling materials. A second thought should be that everything on a conveyor has to be *put* on and *taken* off. This is still handling, from any point of view. Even here, there is a poor way and a good way.

Plan Conveyors Carefully

If you are making refrigerators,

HOW MUCH DOES
SHOCK
COST?



Who knows . . . unless they are using Impact-O-Graphs.

True, Impact-O-Graph won't give you the cost of shock . . . directly. But it will measure the amount of shock your product receives in normal handling. With this information you can take steps to protect your product from costly shock-damage.

Hundreds of progressive executives have already saved hundreds of thousands of dollars for America's leading industrial firms by tracking down the causes of damage with Impact-O-Graphs.

The Air Force, Army, Navy and various ballistic agencies of the government use and have approved the accuracy of Impact-O-Graph as an instrument for measuring shock, acceleration and deceleration.

Various models of Impact-O-Graphs in a wide range of "G" ratings, are available for different requirements. Specify your problem and we'll suggest the correct model.

Impact-O-Graph is a modern, inexpensive, yet extremely accurate instrument that pays for itself many times over where shock-damage is a problem. Send for the complete story. It's National Safe Transit approved. **Leasing arrangements are available.**

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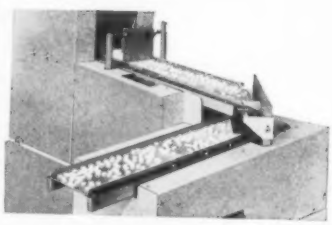

MODEL TL-6

This compact unit permits one operator to perform a thorough and visual inspection of tablets on both sides. Sturdy cyclone unit removes undesirable chips and powder. Increased rates in your inspection department from 50,000 to 150,000 tablets or capsules per hour can now be easily achieved.

Est. 1922 **POPPER & SONS, INC.**
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PerfeKtum®

Write for Bulletin #659F describing our full line of conveyor fillers.

Circle No. 236 on Card, Page 85

for instance, a good way is to do your packaging right on the assembly conveyor, as shown in Fig. 6. Why regard packaging as a separate job? Treat it as a continuation of production and save extra pick-ups.

At the other end of the line, you can take your packages from the conveyor one at a time, if labor costs do not worry you. Or, you may find it makes sense to let a machine do the job for you. This saves confusion, payroll, and often space.

The big point in laying out conveyors is to take it easy. Try to make them continuous in order to eliminate taking things from one conveyor and setting them on another. An attempt also should be made to keep them straight and simple.

Fig. 6 shows two ways to conveyorize the same job. The first lets the conveyors follow column lines in the building, which is probably conventional. But, look at all those right angle turns! It is easy for cases to hang up on such bends unless you have the very best design. A much better layout is shown in the second illustration where the conveyor angles directly to its destination. It may not look as neat to visitors, but it is trouble-free and also takes less conveyor.

3. MINIMUM LABOR

This is the third of your layout objectives. Saving labor does not mean just saving wage costs. It also means doing less training, needing less supervision, reducing the possibility of errors, and centralizing responsibility in fewer people. It means lower hiring and layoff expense and, often, less floor space is needed. Frequently, product damage is lessened since manual work is ofttimes inconsistently performed.

Layout does a great deal here. For instance, see Fig. 7. The illustration shows a straight line arrangement for filling bottles with hair tonic. We pointed out before that straight lines have a lot of advantages. In this view, we see

For faster, lower cost production and packaging...

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gives you frictionless, uniformly smooth flow off the coil and through the stitching head to assure high-speed, uninterrupted operation. Available in 5, 10, 25 and 50 lb. coils. All standard gauges. Special gauges on request. Galvanized and copper-coated finishes.

MID-STATES Stitching and Tying Machines

A complete line of cost-savers to serve every packaging requirement. Write today for further details and prices.

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Using Weber "Hand Stenciling" System

PERSONAL PRODUCTS CORP. CUTS SHIPMENT ADDRESSING COSTS 43%

one man addresses 36 cartons in less than one minute

Quality and cost-conscious Personal Products Corp., prepared a detailed Cost Improvement Report. It showed their current addressing method took 7/100 minute per carton. In addition, it was a two-hand operation requiring substantial capital investment in addressing equipment.

A comparative test was made using Weber touch-stenciling. The result: addressing time was cut to 4/100 minute per carton . . . almost in half. And, the Weber system required no expensive equipment.

The Weber Tab-on stencil method was adopted, then there was a surprise! The one man doing all shipment addressing was addressing 30% faster than the Cost Improvement Test indicated. Using semi-live skids holding 36 cartons, he was addressing one full skid in about one-half minute. Here's the procedure:

1. Weber Tab-On Stencil is prepared in Tabulating Department. (See photos below)
2. Stencil is sent to shipping, where it is directly placed on a Weber hand printer. Only Weber hand printers have built-in ink reservoir containing fadeproof waterproof ink.
3. Cartons are addressed with a fast-one-hand "touch" motion in a "Ship To" label frame preprinted on carton by carton manufacturer. After addressing stencil is discarded—nothing to file.

Here's how the stencil is prepared by the Tabulating Department as a by-product of the shipping invoice.

Weber "tab-on" stencil, with carbon backing, attaches over Ship-To section of continuous invoice forms by pressure-sensitive edge.

Automatic accounting machines prepare invoice and address stencil simultaneously from punched card records.

Invoice forms are separated and stencil attached to Shipping Department copy. Shipping Dept. uses stencil to mark cartons.

Send for free bulletin on Weber "Touch-Stenciling" methods. Packed with ideas on addressing and marking multiple shipments.

Weber

MARKING SYSTEMS

Sales and Service in all principal cities

WEBER MARKING SYSTEMS, INC.
Dept. 21-E
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Send me your bulletin on "Touch-Stenciling" methods.

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City_____ Zone____ State_____

some disadvantages. When a line stretches out like this one, you often find that you need several attendants to keep an eye on the machines, replenish labels and caps, and act in case of an emergency jam-up.

But, with the U-shaped line in the second view, one operator in the middle of the "U" is handy to any point on the line. Also, the same lift truck operator that brings empty glass to the line can take away filled cases. And, notice how much less empty case conveyor you need.

Machines To Save Space

Machine manufacturers contribute much to labor saving. Your package may have some special "fixin's" on it, but that doesn't mean you *have* to use 20 ft. of conveyor to do the job. A cellulose banding machine eliminates a whole battery of girls required to do the same work by hand—and it takes only a few feet of floor space. This same thing is true of an automatic collar applicator.

Equipment such as this should be considered *before* you plan the layout of your operation so that the benefits of each piece of equipment may be most fully utilized. To repeat: Modern equipment, properly placed, may save you the trouble of moving to a new factory. Also, it can help you save money for the dream factory that you may need, or at least work toward, in the future.

4. MAXIMUM PROTECTION

Good layouts have built-in protection for your materials; for example, ingredient stores. With a helter-skelter layout, you may have them all over the place, even adjacent to packaging lines. These materials are subject to contamination, but, with planning, you can work out protected enclosures for them.

Packaging supplies, too, often need protection. Your layout will specify a room for cellophane, for example, so that truckers (using

(Continued on page 74)

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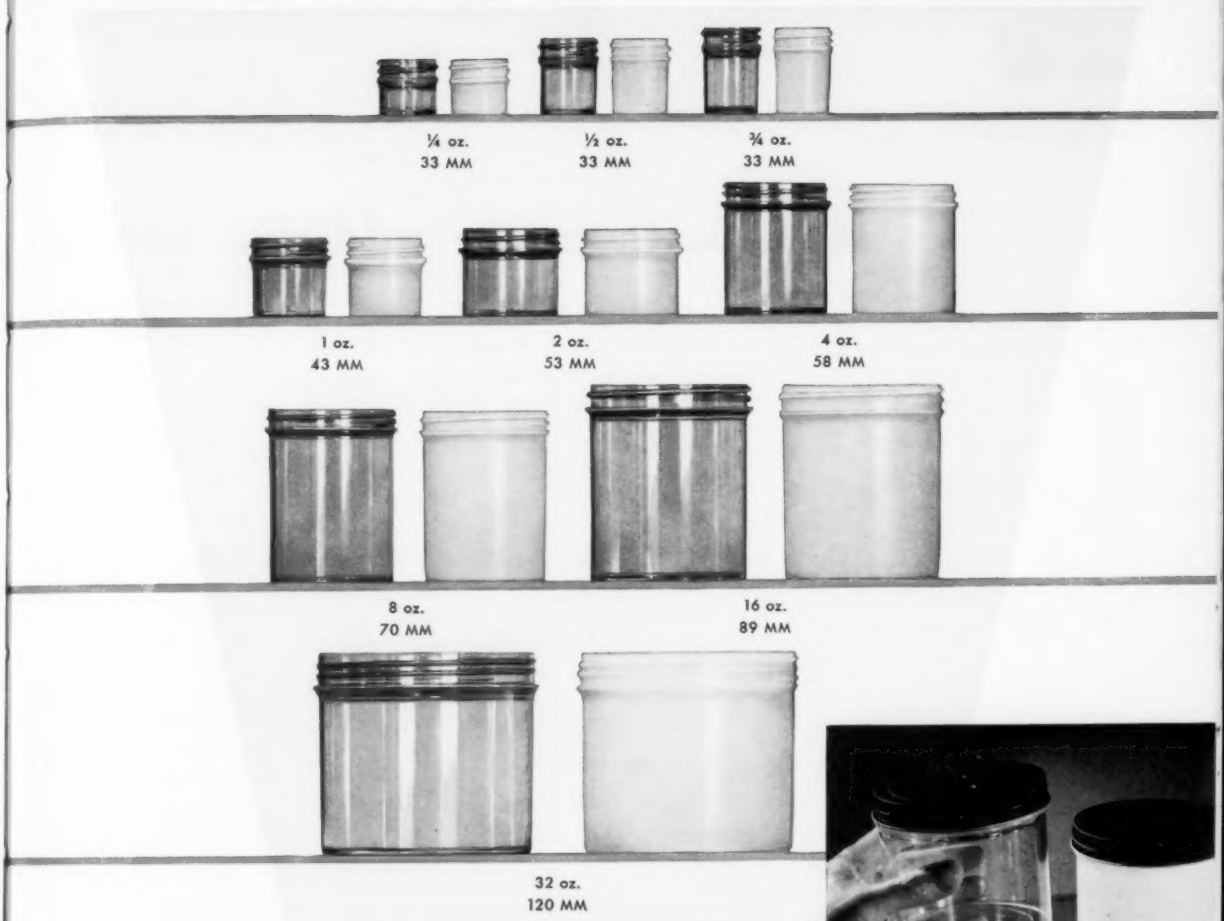
CELLUPLASTIC

SQUAT JARS



A Complete Line..... Competitively Priced

Whether you are selling soothing salves or fine powders, solder flux or cosmetic cream, the Clearsite squat jar is your answer to better packaging and lower shipping costs. Available from stock in nine sizes in clear polystyrene or linear polyethylene. Can also be molded in a wide range of colors to meet special requirements. Any design can be beautifully reproduced in our large and experienced multi-color printing plant. Standard closures available for all sizes.

Here's an attractive line of competitively priced jars that weigh about one-fifth the weight of glass jars of equivalent capacity. You benefit **three** ways: **better packaging, less breakage, lower shipping costs.** Write for samples and prices—Address Dept. 551.

YOUR PACKAGING PROBLEMS END AT CELLUPLASTIC

THE NEW 32 OUNCE PLASTIC JAR

This big beautiful 32 ounce jar has all kinds of packaging possibilities in linear polyethylene with overflow capacity of 32.3 fluid ounces—weight 211 pounds per thousand; or clear polystyrene with overflow capacity of 33.8 fluid ounces —weight 212 pounds per thousand. Either jar takes a standard 120 mm closure.

CELLUPLASTIC CORPORATION

24 Commerce St., Newark, N. J.

Philip H. Derse is a graduate of The University of Wisconsin where he received his B.S. and M.S. degrees in biochemistry. Presently director of laboratories at the Wisconsin Alumni Research Foundation, he has been associated with this organization for the past 12 years.

How tests prove additive safety

By Philip H. Derse
Director of Laboratories
Wisconsin Alumni Research Foundation
Madison, Wisconsin

Although a great deal has already been said and done in efforts to comply with the new Food and Drug Administration regulations, it is quite likely that, in March of this year when the new law became fully effective, a number of packaging engineers were left "holding the bag." Although it is quite late in the game for concerted action, this article is intended not only to provide some background on what is required of packaging materials and how tests are conducted, but to offer some advice on how to avoid difficulty with your suppliers.

Since it is the food manufacturer who bears the brunt of any misuse of food additives, it must necessarily be the one to "put the heat" on its package suppliers so that it can be assured of no harmful additives arising in its food from packaging. The heat *has* been turned on, and package manufacturers, in turn, are seeking out their suppliers in efforts to track down any possible sources of transferable additives. How is this being done?

Testing Materials

In most instances, the package manufacturer is first organizing all pertinent information regarding its products, the chemicals which are used to make the package, and the final chemical composition of the package itself. Next, it is conducting extractability tests on its food packages or packaging materials.

These tests are designed to show whether any of the chemicals which are present in the final package can possibly be extracted from

ANIMAL FEEDING studies furnish clues to additive use through relationship between oral toxicity in animals and projected use of additives thus tested. Key is use of safety factor of human sensitivity compared to sensitivity of animals being tested.

Regardless of how long and for what purpose FDA grants extensions or holds off the literal application of the new additives law, it behooves the package user to know something of additive testing. Mr. Derse offers a lucid explanation of an intricate subject. His observations merit the attention of those wanting to know more about testing.

the package by solvents. This is no simple task. Many of the packaging materials in use today are complicated chemical entities, and analysis for their presence in a solvent is equally complicated.

However, it can be, and is being, done, utilizing the more advanced analytical tools available today. A discussion of the general principles and methods for the study of extractability of packaging materials may be found in published form.*

No Universal Test

It has been stressed that no one extractability procedure is suitable for all packaging materials and all food products. This is because tests must be designed to simulate the extremes of actual use of the package. Thus, the conditions of testing vary considerably in preparation of sample, choice of solvents, exposure times and temperatures, and analytical procedures used.

A number of solvents have been used including aqueous solutions of sodium chloride, citric acid, acetic acid, lactic acid, sucrose, sodium bicarbonate, distilled water, and various fats and oils. Among the analytical tools employed to measure extracted materials are colorimetry, fluorimetry, turbidimetry, ultraviolet, visible and infrared spectrophotometry, and radioisotope technics.

**Food Packaging Materials—Their Composition and Use* (Washington 25, D.C.: National Academy of Sciences—National Research Council, November, 1958), Publication No. 645, p. 40.

TESTING DEMANDS close attention to fine points such as levels of testing—a 90-day subacute oral toxicity follows initial acute oral itself. Further study of compound becomes vital where prior tests and study of animals are inconclusive.

If No Migration

If a packaging material passes a *well-planned* and *thorough* extractability test, chances are that no further work need be done. No question of food additives is involved if there is no migration of chemicals into food from the package. As new and different food uses of the packaging material are evolved or as changes in composition are made, further extractability tests should be performed.

If certain chemicals *are* extracted by the solvents, it is usually necessary to seek and provide further information. How much of the chemical is extracted and under what conditions? Perhaps it is a chemical which has already been deemed safe or for which specific tolerances have been established in certain foods. If so, the problem is simplified. It also can be simplified if the manufacturer of the packaging materials changes the components so as to replace the questionable migrant chemical with a non-migrant one or with one which has been proven.

Use Animal Studies

If this is not feasible, and most often it is not, animal studies are conducted to determine the relative toxicity of the chemical. The objects of these tests as outlined by W. B. Rankin, Assistant to the

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either makes money or wastes it

Readable, attractive marking made by Markem machines on your boxes or labels helps them from the moment they're marked to the time they're used — and can even help future sales as well. Good marking speeds handling . . . reduces waste and packing errors . . . allows quick selection by customers . . . simplifies and encourages reordering . . . carries the "quality" message of modern package design.

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And a Markem marking method makes important "in-plant" savings as well. The right Markem machine, type and specialty ink working in your plant marks the *right* quantities at the right time — with savings in inventory, labor and delivery time . . . eliminates waste from obsolescence . . . handles "short runs" rapidly and economically . . . provides flexibility that allows *one machine to do a variety of marking jobs.*

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Commissioner, Food and Drug Administration, are as follows:

"**1. Find the amount of an additive** that causes no harm to the test animal.

2. Assume that the average man is *ten times* as sensitive to the additive as the test animal.

3. Assume that some men are *ten times* as sensitive to the chemical as the average man.

4. Combine these safety factors and allow in man's diet only 1/100 the quantity of a chemical that is safe in the animal's diet. This is a guide only and may be varied as scientific data indicate to be proper."

Find Acute Oral Toxicity

To provide data to satisfy the demands of objectives is quite a complicated job and often entails large expenditures. First of all, tests must be conducted to determine the acute oral toxicity of the additive. This is normally done with groups of adult white rats, fed, by stomach tube, increasing doses of the chemical.

The dose which kills 50 per cent of the animals within a short time after administration is known as the *acute oral LD 50.* The determination of the LD 50 serves as a guide to further testing to find the amount of chemical which causes *no harm* to the animals. It also serves as a sign post as to whether the use of the chemical should be discontinued if it is excessively toxic in comparison to other additives of known toxicity.

Normally, the next study is a *90-day subacute oral* **toxicity test.** This test is designed to determine the safe level of feeding to animals. Sometimes it accomplishes this end and sometimes it does not. Several levels of the additive are fed to groups of rats, usually by mixing the chemical with the animal's food. A control or no-additive group is included.

Three Additive Levels

The levels of additive employed are frequently a **use level** (level at which it would possibly be present in foods through transfer from the package), **a subacute but slightly toxic level,** and **an intermediate level** (between use and toxic). The animals are weighed

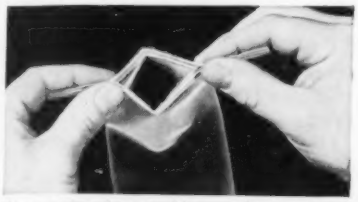
U.S.I. POLYETHYLENE NEWS

A series of advertisements for plastics and packaging executives by the makers of PETROTHENE® polyethylene resins

MAY, 1960 — U. S. Industrial Chemicals Co., Division of National Distillers and Chemical Corporation — 99 Park Ave., N. Y. 16, N. Y.

Packaging Notes

A low-cost sterile polyethylene bag with a wire closure is now being used by the dairy industry for milk sampling and is reportedly finding application in a number of markets including frozen foods and cosmetics. In dairy use, the bags are said to reduce sampling costs up to 50% through replacement of bulky glass containers and elimination of washing, sterilizing and breakage.



New container is opened by pressing in on wire tape. A liquid-tight seal is formed by pulling tape taut, rolling top of bag and folding wire ends together.

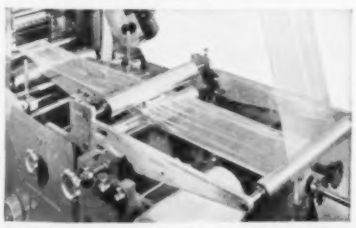
The containers are made of clear, heavy polyethylene tubing, sealed at both top and bottom to keep the inside sterile. A line of perforations is provided for removing the sealed top. Below the perforations are two wires which make it possible to open or shut the bag without touching the sterile opening. The bag is resealed with the aid of the wires, which are bent to form a liquid-tight closure.

A newly introduced gusseting attachment for polyethylene bag-making machines now permits converting flat polyethylene tubing into gusseted tubing without the use of an air bubble.

The new unit permits printing and perforating of flat tubing before gusseting. Among the advantages claimed for this method of converting are improved printing quality, the possibility of printing on one half of the gussets of seamless bags, and placement of perforations within the gussets—without impairing the printed face of bags.

It is also reported that the unit eliminates telescoping rolls and overcomes any tendency of the film to block. Fewer roll changes are necessary, too, because flat tubing gives more footage than gusseted tubing on the same diameter roll. Attendant problems of winding up gusseted rolls are avoided.

The manufacturer reportedly offers complete gusseter kits for any model of polyethylene bag-making machine.



Gusseter attachment for bag-making machines permits converting flat polyethylene tubing into gusseted tubing without the use of an air bubble.

New U.S.I. Resin Produces Film With High Strength, Superior Appearance

Tailored for Produce Bags, New General Purpose Resin to Find Other Uses Where Combined Gloss, Clarity, and Strength Are Needed

The U.S.I. Polymer Service Laboratory has developed a new film-grade resin for producing polyethylene film with maximum clarity and gloss in combination with high impact strength. While the new resin—designated PETROTHENE 112—is tailored for the produce bag market, it should also find application in many other markets where combined gloss, clarity, and strength are desirable film properties.

Melt Index, gms/10 min.	3.0
Density, gms/cu. cm.	.921
Transmittance, %	65
Gloss, %	12
Haze, %	5
Dart Drop gm./F50	210
Draw Down, ft/min.	330

Except for drawdown, properties of PETROTHENE 112 were determined on 1.5-mil blown tubing extruded at 330° F. stock temperature on 1½" MPM with 20/1 L/D ratio.

Special synthesis conditions during manufacture give the new resin outstanding flow properties which permit rapid extrusion of film. High drawdown rate of the resin makes it possible to extrude PETROTHENE 112 into thin gauge film without hot snap-offs. In preliminary tests, heat sealability of films made of the new resin was shown to be good under a wide variety of heat and pressure conditions. Treatment of the film for printability has also been accomplished with good results at commercial haul-off rates.

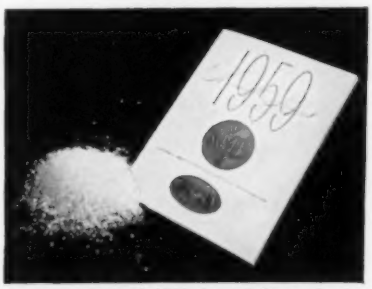
Recommended Extrusion Conditions

For peak gloss and clarity, PETROTHENE 112 should be extruded at about 330° F. stock temperature with a minimum blow ratio greater than 2 to 1.

PETROTHENE 112 is available in low-, medium- and high-slip formulations and in the no-slip form. A technical data sheet on this new resin may be obtained by writing to the Technical Literature Dept., U.S. Industrial Chemicals Co., or any of U.S.I.'s sales offices.

National Distillers' Annual Report is Polyethylene Coated

Cover stock for National Distillers and Chemical Corporation's recently issued 1959 Annual Report is extrusion coated with a protective layer of polyethylene. Advantages of using the polyethylene coating include durability, high gloss finish, and protection of the cover against tearing and soiling. The polyethylene coating also adds to the attractive appearance of the report.



National Distillers' 1959 Annual Report is the Company's third annual report to have a polyethylene coated cover. Pellets of PETROTHENE 203-2 polyethylene resin, the coating resin used, are also shown.

In producing the cover, ten-point cover stock was first gravure printed. The printed roll was then extrusion-coated with PETROTHENE 203-2 resin.

The sheeted covers were next printed on the reverse side by letterpress with rubber plates, then the cover was embossed and stamped with gold leaf.

National Distillers and Chemical Corporation has successfully used tough, clear polyethylene coatings for its annual report for the last three years. The company foresees a growing use of polyethylene coating for publication covers, both for the feeling of quality they impart as well as for their durability.

High Greaseproofness Feature of New Coating Resin

U.S.I. has introduced a new polyethylene coating resin which reaches 100% passage of Military Specification MIL-B-121B for greaseproofness at a lower coating weight than other resins of similar melt index and density. The new resin—PETROTHENE 205-15 with a density of 0.924 and a melt index of 3.0—has excellent adhesion with a wide variety of porous and non-porous substrates.

The flow characteristics of PETROTHENE 205-15 are well suited for high-speed extrusion coating. Coatings as thin as 0.5-mil can easily be applied. Neck-in, which results in costly trim loss, is reduced to a minimum. Polymer build-up at the die is virtually eliminated. According to U.S.I. Polymer Service Laboratories, maximum polyethylene to substrate bond strength is achieved at melt temperatures of 575° F. and higher.

PETROTHENE 205-15 is unique in that it offers the wide heat-sealing range normally associated with a low-density resin, combined with high greaseproofness usually associated with higher density resins. A technical data sheet on this new coating resin may be obtained by writing to the Technical Literature Dept., U. S. Industrial Chemicals Co.

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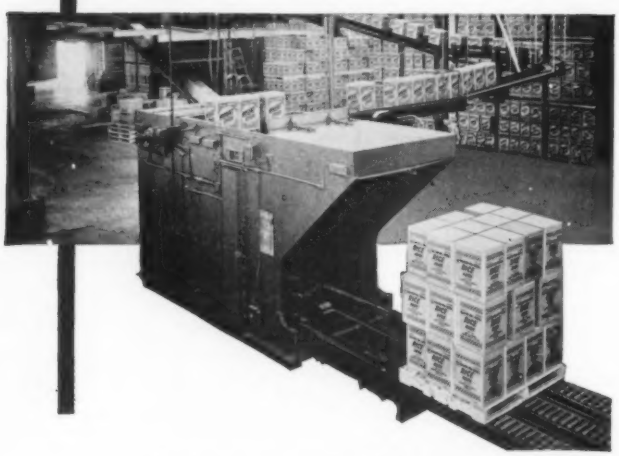

Palletizes cartons, cases, rigid bags quickly, economically

Referred to as the "perfect link between packaging and warehousing," the LAMSON AUTOMATIC PALLET LOADER is acclaimed as a huge, money saver by leading producers of package products.

Man hours per pallet load are cut. Considerable saving occurs in the reduction of damage or breakage to cartons. Valuable men are freed for other important duties.

These reductions have been more than enough to amortize the entire cost of the LAMSON AUTOMATIC PALLET LOADER.

The introduction of the Automatic Pallet Loader was another LAMSON first in the materials handling field. A result of the ceaseless engineering vitality of LAMSON men firmly based upon 75 years of experience.

Why not bring your materials handling problems to the leaders in the field? Write LAMSON today for the name of your nearest Field Engineer. Or, simply clip this advertisement to your letterhead and mail to:

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Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

and observed weekly with accurate food consumption records maintained. After 90 days of feeding, the animals are sacrificed and the effects of the chemical on food consumption, growth, mortality rate, blood and urine composition, and the weight and microscopic structure of organs are determined.

There have been some cases where the 90-day subacute toxicity test is sufficient to establish the relative safety of an additive. *If* the compound has a very high acute oral LD 50 and a very low use level, *if* no toxicity whatsoever is exhibited at the use level and the intermediate level, and *if* the pathological findings at the subacute level correlate well with the symptoms exhibited by animals in the acute oral test or with symptoms shown by similar chemicals of known safe level, a safe level for the compound may be established.

Unfortunately, it is most usual for something to show up in the 90-day subacute study, which makes it necessary to study the compound further. Here again the decision must be made as to whether such further studies as are necessary to establish the relative safety of the chemical are economically feasible, when consideration is made of the current and potential sales volume of the compound. This is often a tough decision to make since removal of the chemical from the market, even though it may not be a big money maker, will possibly cause serious packaging problems for certain large volume food items

The Two-Year Study

If it is decided to continue studies of the compound, the next step is normally a two-year rat feeding study, with sometimes a concurrent two-year dog feeding study. These studies are designed to pinpoint the level at which the compound causes no harm to animals, even when ingested over their life span (rats).

Several levels of feeding are employed with records maintained

of weight gain and food consumption. A wide variety of tests are conducted to determine the fate of the chemical and its effects on the life of the animals. Normally, this two-year study is sufficient to establish the safe level of the compound. If abnormal pathological changes are detected, further work may be necessary.

The cost of a complete study as outlined above runs between $40 and $50 thousand dollars. Obviously, there are few packaging material manufacturers or chemical suppliers who won't have trouble if a number of their materials contain extractable compounds of unknown toxicity. If this happens they are faced with decisions as to which materials warrant animal studies and which materials take precedence.

Food Companies' Help Valuable

One important factor which we have not previously mentioned and which may directly influence decisions as to whether animal work should be conducted, is the necessity of having a precise analytical method for measuring small quantities of the chemical in the food where it might migrate.

This is where the assistance of the particular food companies is of tremendous value. Their familiarity with the chemistry of their products, and previous experience in extracting and measuring other additives in their products can be instrumental in development of methods of analysis for the migrant compounds from packaging materials. Other technical assistance can be offered by food companies to help plan the experimental approach, perhaps carry out some of the work, and even provide financial assistance—if the particular package involved is vital to their operation and continuance of the package is otherwise questionable.

Tremendous though the impending work load may seem today, one can be optimistic. The food additives problem, although challenging, is still no match for American industry. *(End)*

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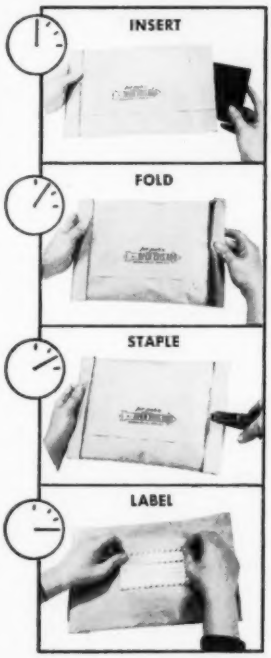
Shatters Direct Labor Cost



JET-PAK sets new packaging speed record of 15 seconds or less per unit—ready for mailing!

New packaging idea for semi-fragile, small products completely destroys old maxim that inexpensive packaging materials cost more in labor.

JET-PAK costs less than almost any other kind of material—yet, its simplicity and completeness as a package eliminates all waste motion, speeds packaging process, drives down labor costs per unit, costs far less to use than any other kind of material.

Security and protection are complete. JET-PAK cushions and insulates with millions of tiny particles of resilient paper held between double walls of tough, moisture-resistant, asphalt-laminated Kraft paper. Contents are safe from damage, pilferage, rain and abrupt temperature changes.

Drop tested by U. S. Post Office, JET-PAK is approved for mailing purposes. Cheaply imprinted at factory, JET-PAK adds impact to advertising programs. Produced in 14 regular sizes, JET-PAK is flexible and available.

JET-PAK is the newest, speediest, safest, *cheapest* way to package small units.

Prove it to yourself!

Score your present method against jet-pak

MODERN PACKAGING REQUIREMENTS	jet-pak	YOUR METHOD
1 High Security	Approved by U.S. Post Office	
2 Low Material Cost	3¾¢ ea.—10M—No. 3 size	
3 Lowest Labor Cost	Average—15 sec. per unit—ready for mailing	
4 Minimum Waste Motion (supplying materials to bench from storeroom)	One item	
5 Low Cost Imprinting	50¢ per 1,000	
6 Simplified Procurement	1 source	
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Book Mailers of Educational Materials	Free imprint on Jet-Pak Book Bags Save on Postal Rates	

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Packaging Division
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Vibratory feeding involves more than merely the energizing of a magnet by pulsating current, which, in turn, vibrates the feeding trough. Mr. Lubold urges the importance of understanding the structure and function of the trough itself, and he stresses such basic requirements as rigidity and balance. He also reviews the elements of a satisfactory flow and feeding of material—including a steady or uniform material supply, and a balancing of the feeding trough with the filler, or other take-away action. His comments on such practical points as keeping uniform voltage merit the attention of anyone seeking to understand vibratory feeding principles.

There is no mystery about vibratory feeding

By Richard P. Lubold,
Applications Engineer,
Syntron Company, Homer City, Pennsylvania

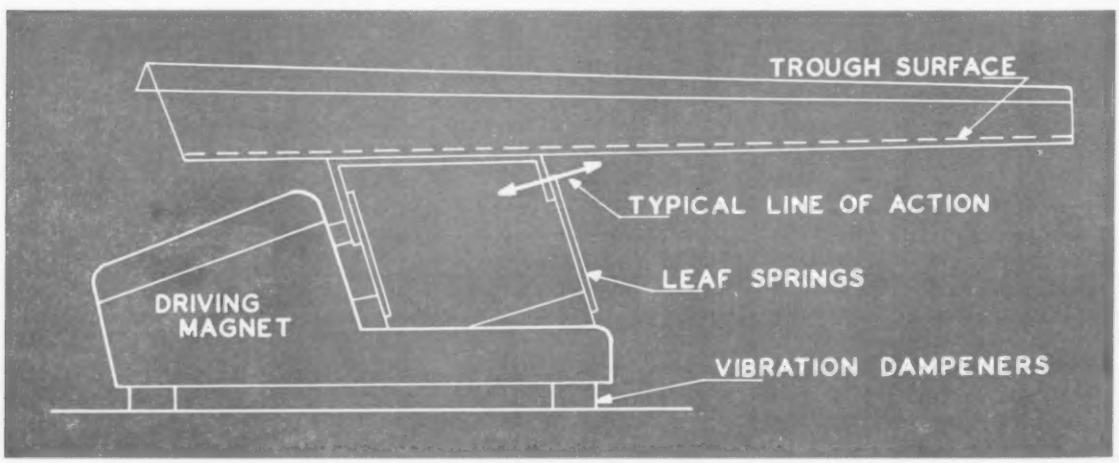
Whenever package users watch their own, or some other company's, vibratory feeders in action, their attention usually focuses on the vibrating action itself. However interesting this is to watch, the fact is that it diverts attention from other important aspects of vibratory feeding. As some practical experimenters have learned, by trial and error, there is much more to getting a correct trough than merely asking your shop or supplier to take a piece of metal and shape it into one suitable for your needs.

Likewise, no user should go overboard in the other direction and specify, or design, a feeding trough on the basis of theoretical calculations. A quick review of basic principles of vibratory feeding reveals why this admonition deserves heeding.

Current Energizes Magnet

Heart of the action is a pulsating current used to energize the magnet. Assuming that this current pulsates 3600 times/min. through the magnet, you thus have 3600 vibrations/min. The magnet works with a set of leaf springs positioned at a particular angle to control the trough movement in accord with the energizing and de-energizing of the magnet.

The direction of travel of the trough, as determined by the angle of the leaf springs, results in a definite line of action (see Fig. 1). The combination of the pulsating current through the magnet and



1 **KEY FEATURES** of vibratory action include driving magnet, leaf springs, trough, and vibration dampeners. Angle of leaf springs affects trough movement in accord with current pulsations from energized magnet. Current on leaf springs governs amplitude of vibration.

its effect on the leaf springs along the line of action, gives you the amplitude of vibration, or actual trough movement, parallel to this line of action.

Particles Drop, Get New Position

This is important because it is what causes the individual particles being fed to move along. Visualize this as a right triangle (see Fig. 2). Assume that the hypotenuse of this triangle is the line of action, or travel, the length of which represents the amplitude of action. *Any* given point on the trough surface of the vibratory feeder moves back and forth *parallel* to this line of action.

For convenience of discussion, take just one particle of the product being fed. The trough vibrates along the line of action. In effect, on one vibration, the trough surface is pulled down and backwards *from under* the particle resting on the trough surface. But the particle can only fall *straight downward*. As a result, it lands on the trough surface in a new forward position. Now, when the leaf springs return the trough to its original up and forward position, the particle, in every instance, returns with it.

Repeating this cycle at high speed is the basic element of vibratory feeding. Because of this high-speed vibration, each of the particles is thus moved forward in the direction of travel, with the various respective vibrations.

Why Not Calculate Flow?

On this basis, it looks easy to calculate how far the particles should move. Suppose that, at 3600 vibrations/min., you have an amplitude of 0.062 in. and know the angle of the line of action with respect to the trough surface. Theoretically, this should let you determine the rate of flow.

In other words, since you know the *exact* extent of your vibration, you can calculate how far forward each particle moves with each vibration. It would be reasonable

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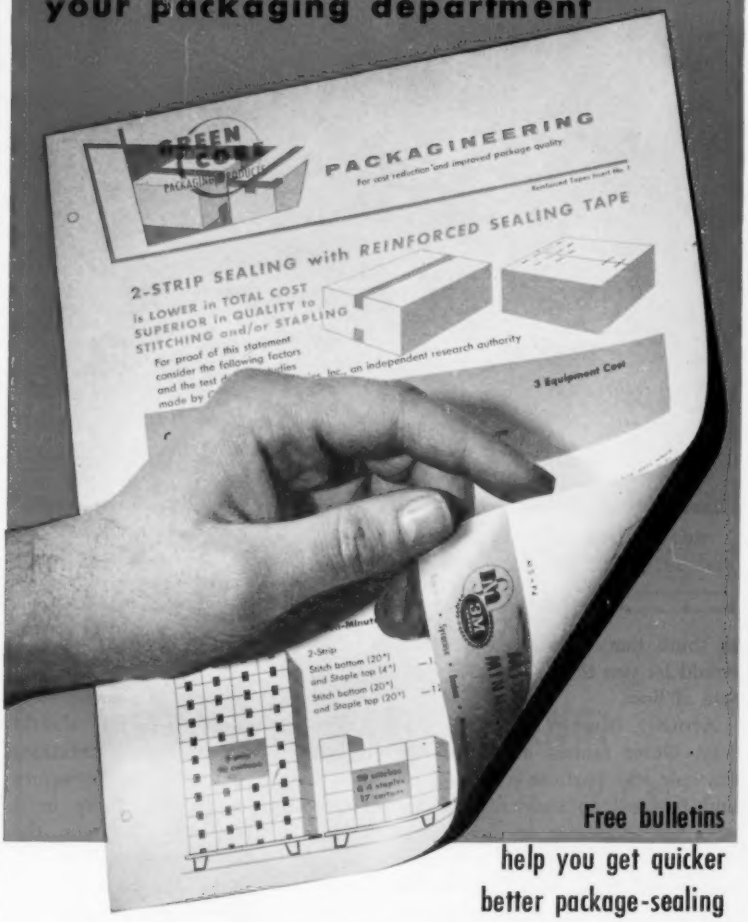

Free bulletins help you get quicker better package-sealing

A new bulletin in the Packagineering series shows the advantages of 2-strip sealing with reinforced tape. Tests recently made by an independent research laboratory prove such important savings, together with improved carton-closure, that you should have all the facts.

In addition to cost-saving, 2-strip carton sealing with Mid-States Green Core Reinforced Tapes, gives you (1) Strength of Closure, (2) Completeness of Closure, (3) Safety from Pilferage, (4) Ease of Opening, and (5) Carton Reusability.

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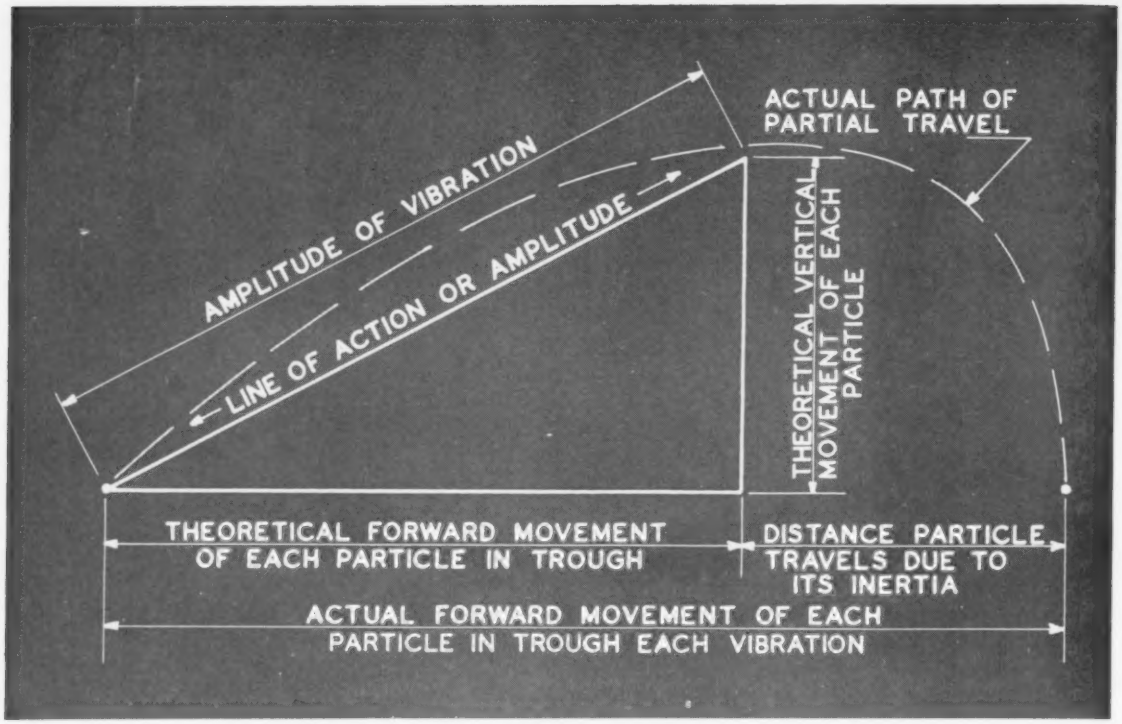

ACTUAL PATH OF PARTIAL TRAVEL
AMPLITUDE OF VIBRATION
LINE OF ACTION OR AMPLITUDE
THEORETICAL VERTICAL MOVEMENT OF EACH PARTICLE
THEORETICAL FORWARD MOVEMENT OF EACH PARTICLE IN TROUGH
DISTANCE PARTICLE TRAVELS DUE TO ITS INERTIA
ACTUAL FORWARD MOVEMENT OF EACH PARTICLE IN TROUGH EACH VIBRATION

2 **BASIC PRINCIPLE** of vibratory feeding explains why particles move forward. Each vibration causes trough to retract downward at angle from particles, thus leaving particles in air. Particle can fall only straight downward and so takes new position on surface of trough.

to think that simple mathematics would let you thus determine your rate of flow.

Actually, it never works out this way. Other factors enter in. For example, the particle is moved up and forward so suddenly, its inertia has a tendency to carry it forward further than the horizontal component of our amplitude would indicate. (See Fig. 2.) The material weight, moisture content, shape, hardness, stickiness, and temperature, are important considerations.

Voltage fluctuation may increase or decrease amplitude of vibration by varying the strength of current energizing the magnet. Any of these can upset the theoretical calculations, thus making them of little help in determining the feeder rate of flow and capacity. These variables deserve stressing because it is always a temptation to try to calculate the rate of flow and trough capacity by this simple mathematical means.

Trough Limitations

Anyone seeking to get the most from vibratory feeding should clearly understand the limitations on trough and weight. To assure successful operations, there must be a definite ratio between the weight of the *moving* components and that of the *fixed* components of vibratory feeding equipment.

Fixed components include the base and the driving magnet. *Moving* components include the trough and, to some extent, the trough load—that is, the material being fed, say, to a filler. In effect, the fixed components should be several times heavier than ones moving.

Trough load should be of primary interest to package users because it determines the quantity per hour a feeder of given size can deliver. But in doing this, it is important to keep in mind the basic principles governing trough design. The difficulty is that it looks so easy to furnish an oversize trough.

Keep Your Ratio

When you add a larger trough than the fixed components can handle, you are taking that much weight away from the load of product this trough can feed. A good rule of thumb is a ratio of 3:1 between moving and fixed parts. In other words, your fixed parts should have a mass, or weight, about *three* times that of the moving parts. The point to remember is that trough weight and product weight go together, as related to vibratory feeding.

The material and structure of a trough have a definite bearing on its performance. Practical trough limitations range from a minimum of 18 gauge to a maximum of 11 gauge sheet steel for small vibratory feeders. Going outside these limitations may lead to difficulty. For example, use of a heavier metal means a small size trough in order to avoid upsetting the basic ratio.

(Next page)

Rigidity And Balance

Two attributes of a good feeding trough are: (1) rigidity, and (2) balance. Rigidity is necessary to avoid whips and secondary vibration. Effect of these may result in the material bouncing as it is discharged from the trough, or, backfeeding in the trough. In using the thinner metals, it may be necessary to have excessive ribbing in order to let the vibration transmit properly to all portions of the trough surface.

Balance deserves attention. Any trough must be mounted so that the center of gravity has a definite location with reference to the vibratory sources, or fixed components. Since it uses a spring system, a center is difficult to locate precisely, but a helpful approximation is that the line of action should pass through the center of gravity of the trough. Unfortunately, this is not always practicable. It does stand, however, as a goal toward which to strive.

What About Overhang?

But suppose a package user thinks he needs a certain overhang of the trough. He must remember that this may interfere with the normal balance and relation to line of action. You can do only so much "stretching" of a trough without upsetting the balance of the equipment. When a given packaging operation requires a particular overhang, the only solution is to lengthen the trough. And, when the trough length approaches the maximum allowable weight in accordance with the ratio of that size drive magnet, the next step is to use the next larger size drive magnet.

Thus, in this case, the size and weight of the trough, rather than the quantity of material being fed, actually determines the size of the drive magnet. In this connection, shape and depth of the trough are usually not especially important or critical except under certain conditions. For example, an unusually large projection from a standard trough, such as a downspout-type discharge, may adversely affect the feeding action. If it is too long, there is too much concentrated weight, and you are likely to induce a secondary vibration or whipping action.

Watch Cross-Sectional Area

A major principle on which successful vibratory feeding rests is scrupulous attention to maintaining the cross-sectional area—the depth of material in a trough of a given width.

Suppose at the point where your product enters the vibratory feeder, the cross-sectional area is 36 sq. in. This might be 3 in. deep in a 12-in. wide trough, or 4 in. deep in a 9-in. wide trough. The rule is that the *cross-sectional area* in terms of square inches, rather than width or depth as such, is the *controlling factor.*

Now suppose a user wants to narrow down, or funnel out, the discharge point. For example, you think that the trough should taper down in width to 6 in. at the discharge. It may be that you have equipment best served by a 6-in. discharge. In this case, as the material passes through this narrower portion of the trough, it is forced to increase in depth to 6 in. since the same cross-sectional area of 36 sq. in. will be maintained. This results in a "squeezing" action on the particles of the product, resulting in a reduced rate of flow.

Few Products Compress

An obvious exception is the case of product or material which can be compressed. However, products of this sort are not numerous; for all practical purposes, the general rule remains that you cannot cut down the cross-sectional area. As an alternative to raising the height, however, it may be possible to use a "step" in the trough surface near the discharge point so that, in effect, the flowing material drops down a step at the point where it is being compressed. This is roughly similar to raising the depth

For more information circle No. 245 on Reader Service Card, Page 85

in order to maintain the same cross-sectional area.

At the same time, this is not a suggestion to use baffles or obstructions within the feeding trough. Normally, it is best to avoid such obstructions when seeking efficient vibratory feeding.

Similarly, the angles of the sides of the trough are not usually critical. A given angle may prove more advantageous from the standpoint of convenience in making a trough, than in controlling the flow of product. As a rule, however, the *more obtuse* the angle of the trough sides, the *greater the volume* of product that can be handled on it. Such an angle increases the volume and is useful in the case of a particularly light-weight material—where a large volume of it does not upset the 3:1 ratio, or add to the burden of the trough weight.

Getting The Right Flow

Two points deserve special attention in keeping an adequate flow of product through the vibratory feeder: (1) There must be a uniform, or even, delivery of product to the feeder trough, and (2) the vibratory feeding action must keep pace with, or get slightly ahead of, the discharge—such as at the filler.

Packagers who speculate on the desirability of an intermittent method of supplying material to the feeder trough may overlook the fact that a flow of that kind is inherently bad for a successful vibratory feed. You must have a *constant and dependable source* of material in order to maintain a uniform discharge from the trough at all times. This can be accomplished by a properly designed supply hopper, surge hopper, or other conveyor feeding at a fixed rate.

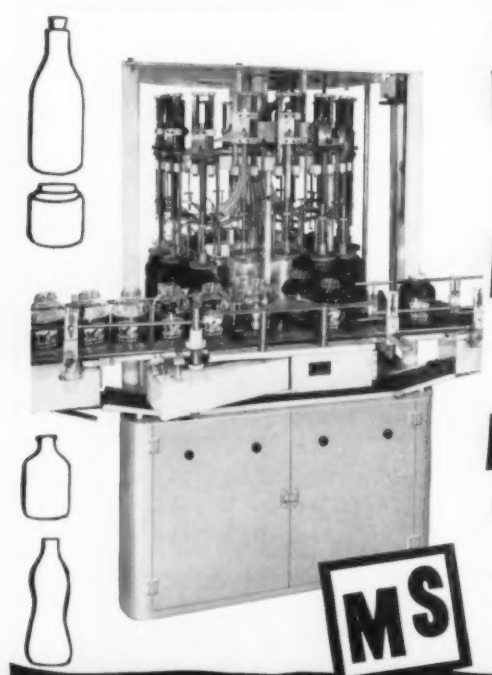
Your ability to keep slightly ahead of demand by the filler depends on the particular product being packaged. With some products or materials, it is possible to let them backlog or accumulate—such as with a stacking-up action used in handling cookies.

However, not all products lend themselves to backlogging, and not all filling equipment is conducive to supporting a backlog. It may be necessary to hit the delivery "right on the nose." If this is the case, it is all the more imperative that the feeding supply be adequate to the delivery, so that the feeder trough, and hence the filler is never starved for material.

Check Hoppering Aspects

An important technique is to *match* the flow of material from the hopper to that being demanded by the vibratory feeder. A lot depends on the hoppering characteristics of the material, its ability to flow, etc. For example, a fine, powdery material might be aerated or fluffy, and rush uncontrollably from the hopper. Some of these materials, when aerated, have this tendency to flow like water, which is known as "flushing."

In this connection, it is important to furnish a dependable, or even, bed or layer of material to the



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- Quick changeover . . . thru 1 gal. capacity

AND TROUBLE FREE . . .

- Accurate, smooth, fully automatic
- Fewer inactive filling tubes at any one time
- Container controlled in starwheel as tube enters

CAN PAY FOR ITSELF IN A YEAR

- Moderate investment—lower packaging unit cost
- Minimum moving parts
- Easy cleaning—low maintenance

MS

MS-16 ROTARY VACUUM FILLER
(Also 12, 20, 24, 36, and 48 Tube Models)

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For more information write direct to manufacturer Circle No. 247 on Card, Page 85

no matter what you wrap

WE'LL TEST SHIP IT FREE with KIMPAK®

interior packaging

Does *your* packaging pose mountainous problems? Is your product as heavy as these great stone faces or as fragile as a butterfly wing? If you're draining profits with inefficient cushioning, getting reports of damaged products, or even using more storage space for materials than you can spare, KIMPAK interior packaging is designed to solve these problems.

Treat your product to a FREE test-shipment with KIMPAK Compressed or KIMPAK Super Crepe interior packaging. See for yourself how each of these new superior cushioning materials save time and money for you.

Return the handy coupon below for FREE test shipment sample.

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INTERIOR PACKAGING
KIMPAK

TO: Dept. No. PE-4 Kimberly-Clark Corporation, Neenah, Wisconsin
Our product is _____. At no obligation or cost to me:

- ☐ Please provide sufficient KIMPAK Compressed for a test shipment.
- ☐ Please provide sufficient KIMPAK Super Crepe for a test shipment.
- ☐ Bring portable laboratory kit for making shock, thickness, and scratch tests at our offices.

Name _____ Title _____

Firm _____

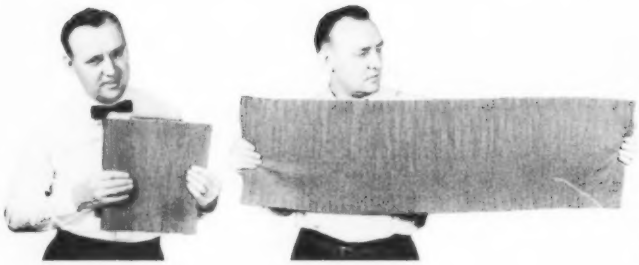
Address _____

City _____ Zone _____ State _____

PLEASE PRINT OR TYPE

2 NEW CUSHIONING MATERIALS TO CUT YOUR PACKAGING COSTS

Save 80% in Storage Space



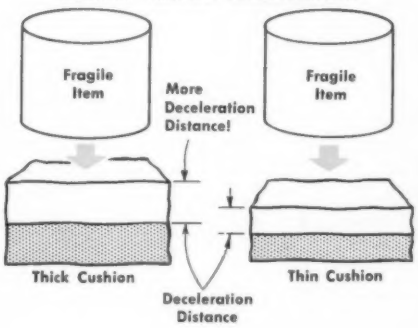
KIMPAK Compressed Interior Packaging offers a big bonus value: it comes to you reduced to 1/5th its "in-use" volume, thus saving over 80% storage area. In use, it is quickly expanded to any density required. It fills voids easily, wraps around delicate points and projections. With KIMPAK Compressed, your most critical products travel in standard cartons without a shift or jolt.

Kimpak protection at a new, low cost

Here is a brand new low, low cost material. Called **KIMPAK Super Crepe,** it gives top cushioning performance, yet cuts protection costs to the bone! Don't cancel out the sweat, toil, and costs of production with ineffective protection methods. KIMPAK Super Crepe will protect your products to the end of the trip.

May we give you an on-the-spot demonstration of KIMPAK-ability? Ask, too, for your FREE test-shipment sample. There's absolutely no obligation for either, of course. Just check the coupon on reverse side of this page.

WHY THICKER CUSHIONS PROTECT FRAGILE COMMODITIES



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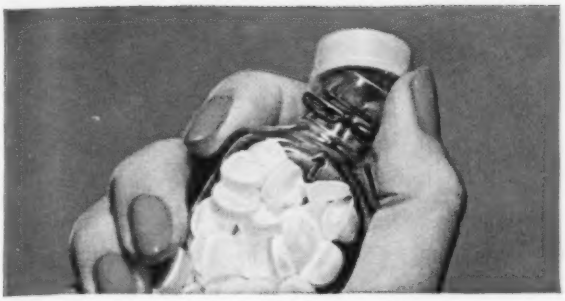
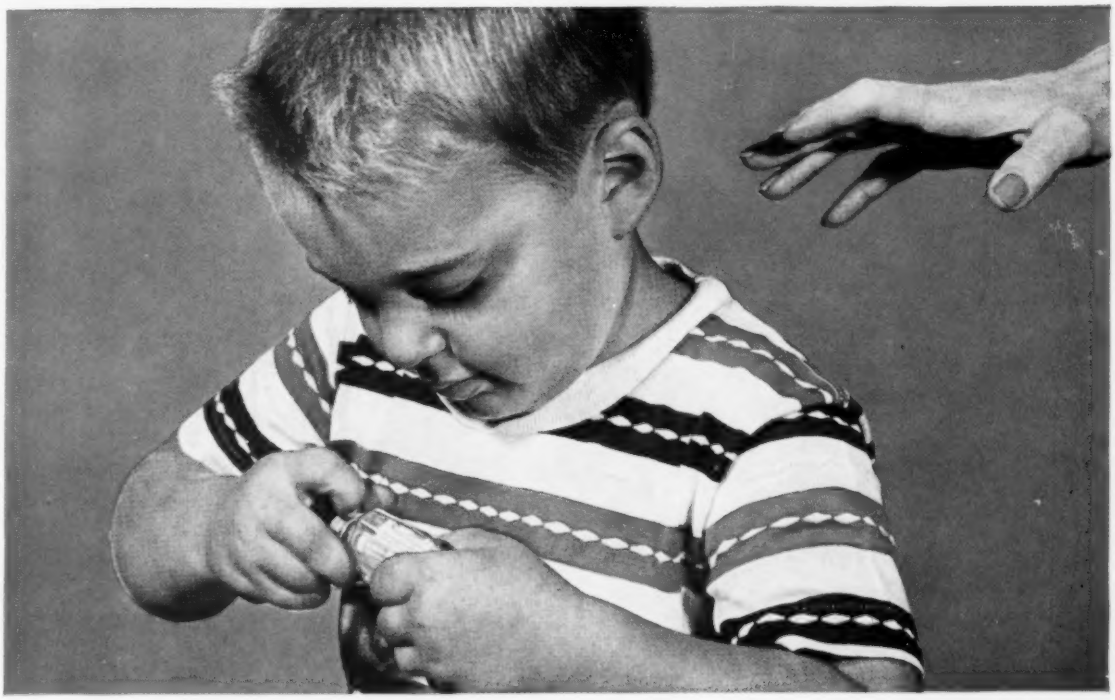


Grownups *flick* them off...

snap them on...



Packaging tackles a safety problem

Children find it harder to remove Owens-Illinois safety 'snap-caps'

Why was it Owens-Illinois who designed the safety snap-cap?

Because we are a *packaging* company, not merely a maker of closures.

Both by viewpoint and by facilities, we're equipped to tackle a problem like this from many aspects. We work with a variety of materials—glass, paper and metal, as well as plastics. We know their characteristics and how to get the most out of them. We combine the talents of many specialists.

As a result, we specialize in just one thing—solving your *packaging* problems.

METAL AND PLASTIC CLOSURES
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO
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vibratory feeding trough, and to do this with a uniform flow. This means that the hopper must be capable of releasing the material *only* as demanded by the feeder.

It should be noted that sluggish-flowing materials may have a tendency to hang up in the hopper and "starve" the feeder trough, where "flushy" materials may pour from the hopper and flood the trough with material. However, correct hopper design, or application of hopper vibrators, can overcome these tendencies in many cases.

Your Voltage May Change

Sometimes package users are puzzled by unexplained variations in their vibratory feeding. They may overlook the fact that dependability of flow of material depends on *uniformity* of voltage.

In the course of starting up packaging line operations each morning, it often happens that equipment is not turned on all at the same time. Rather, crew members and mechanics turn on the machinery in successive steps during the start-up period, or operate equipment intermittently during the shift, as line operations require.

When this happens, you may get a definite cut-back in the voltage being fed to the vibratory feeder. This is significant because changes in the voltage mean changes in the intensity of the pulsating current energizing the magnet. This increases or decreases the pull of the magnet, thus increasing or decreasing the feed rate.

Keeping It Uniform

One solution is to use a constant-voltage transformer ahead of the controller on the line. This evens out the voltage. Another route to the same result is to use a voltage regulator. But, by whatever means, it is important to have a uniform voltage at the feeder, if a uniform feed rate is required.

In order to get the most from such equipment and to capitalize on the basic principles of vibratory feeding, the pulsations of current to the magnet must be fairly uniform; otherwise, the trough amplitude will vary, causing a variance in the feed rate, thus preventing the desired flow to the filling equipment. It pays to keep track of your electrical conditions elsewhere in the plant in order to avoid this difficulty. *(End)*

Richard P Lubold attended the General Electric technical school at Erie, Pennsylvania, specializing in industrial engineering. During his years with General Electric prior to joining Syntron, he did tool and die, methods, and development work. Associated with the Syntron Company since 1951, he did checking and design work in the engineering department prior to becoming applications engineer.

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VACUFLOW, Jr.

SEMI AUTOMATIC DUSTLESS POWDER FILLING

Great flexibility. Immediate adjustment to different densities. Switches from non-pulsating to tamping action, at will.

THE VACUFLOW JUNIOR is ideally suited for handling products such as soluble coffee, powdered milk, baby powder, chemicals, insecticides and many other free flowing as well as non-free flowing powders. Its low initial cost and durable, versatile performance means "lower cost per container" — truly typical of Pneumatic bottling and packaging equipment.

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Rhinelander Glassine Greaseproof Tailor-made Papers...

Packaging with Glassine and Greaseproof papers means a "you name it" versatility that you just can't match with other packaging materials. You start with basic greaseproofness . . . odor resistance . . . high tensile strength . . . smooth finish . . . excellent printing surface . . . transparency or opacity, and a variety of weights and colors. Then, as required, you can add many extra qualities such as wet-strength, moisture vapor resistance, gloss, heat-seal and release properties through coating, waxing, or laminated combinations. Best of all, you are working with the inherent economy and beauty of paper . . . the finest of all packaging materials. Let us discuss with you a Glassine or Greaseproof paper tailored to *your* requirements. Write for information, stating application.

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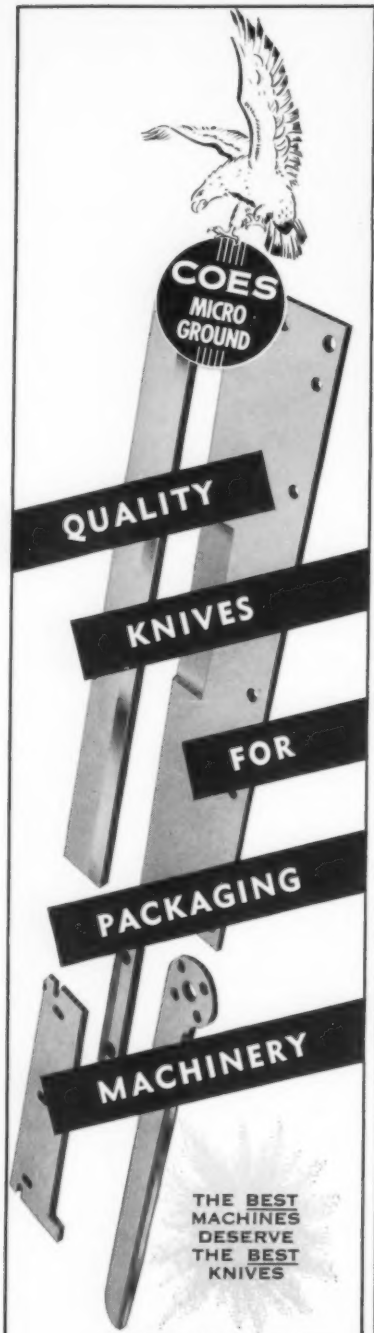

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FILLING WOOD BOXES WITH FOLDING CARTONS made in company's carton plant. Packers avoid tight packing, jamming, or straining cartons, resulting in reduced stoppages in lines.

Keeping folding cartons intact pending their use on automatic packaging machinery is often a problem. Mr. Combs tells how wooden boxes (1) protect the flat cartons and (2) provide increased storage space for cartons.

Using wood boxes to assure protection of folding cartons

By **Irvin W. Combs,** *Packaging Engineer, Plough, Inc., Memphis*

To maintain a chain of protection from the point of manufacture to the point of use we provide wood boxes for our flat folding cartons. The added labor and cost of this packaging is more than offset by increased storage and trouble-free carton usage. *(Next page)*

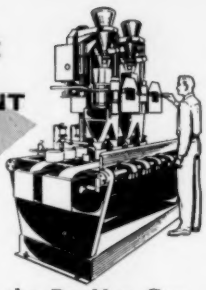
Irvin W. Combs is a graduate of Southern Law University and has been associated with Plough since completing military service during World War II. Since joining Plough he has studied industrial engineering under its in-company program and has completed the methods-time measurement course of the MTM Association. Prior to becoming packaging engineer, Mr. Combs was time study engineer and earlier was in the packaging equipment maintenance department. He is a member of the American Institute of Industrial Engineers.

CARTONS ARE SUPPLIED TO PACKAGING LINES from wood boxes. Wood allows stacking to ceiling height, using all available storage space, and full capacity of handling equipment.

Start of this method is at the outfeed of the automatic gluing equipment in our carton plant. Packers **put the discharging carton blanks into wood boxes.** They fill these boxes but avoid packing them too tightly, jamming cartons or putting strain or distortion on them.

Also, they **mark each box with a label** bearing a rubber stamp of large, legible type, identifying the

CHOOSE THE EQUIPMENT to fit the job



Illustrated is the Bar-Nun Can Line for feeding, filling, packing and ejecting cans, jars or cartons. Gump Equipment also includes net weighers for manual lines, and automatic bag packaging equipment. Packagers of dry powdered, granular or crystalline materials can stop costly overweights and save on packaging labor with the right model of this highly accurate and dependable equipment. Write for recommendations on your packaging requirements. Tell us the material, weight, container, capacity desired.

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IT'S OPEN IN A JIFFY!

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★ Tear Tape Opener—
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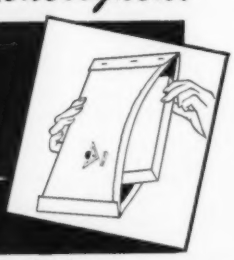
★ NO PRICE INCREASE!



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*Clupak, Inc.'s trademark for stretchable paper.

New PACKAGE COMPRESSION TESTER

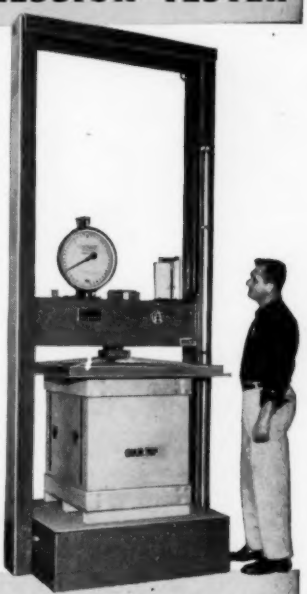
Built specifically for tests on shipping containers, packages and packaging materials.

Rugged and simple in construction, this new L.A.B. tester's relatively low initial cost makes it ideal for the container industry.

Available in 2,000, 3,000, 5,000 or 10,000 lb. capacity, with load opening 40" sq. x 48", 60" or 72" maximum box height.

Compression load is indicated by precision dynamometer scale. A load vs. deflection recorder is optional.

Write for full information on this unique and practical compression tester.



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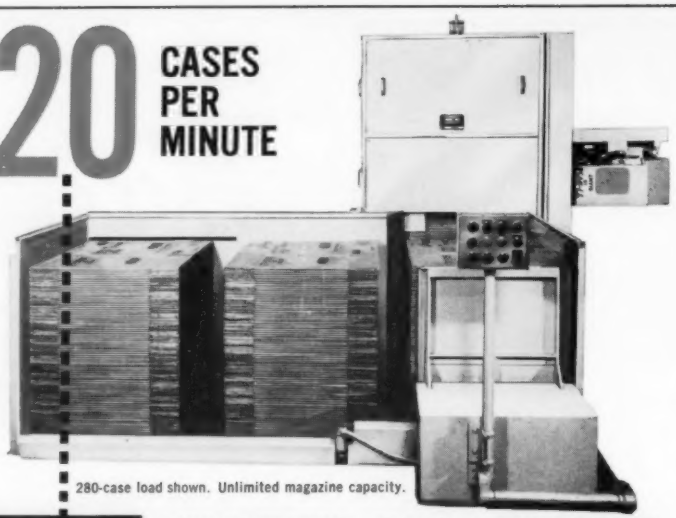
A certified NSTC Testing Laboratory. Also makers of Conbur Incline-Impact Testers, Vibration Testers, Drop Testers and Quick-Release Hooks.

20 CASES PER MINUTE



280-case load shown. Unlimited magazine capacity.

CARAL SHIPPING CASE FORMER

No operator needed! Fully automatic CARAL unit forms cases at speeds to 20 per minute. Smooth, jam-free operation adjusts to standard and special case sizes; adapts to all standard case packers with a minimum of modification. Easy, floor level loading. Cases formed from top of stack. Units now operating save owners dollars and down time. The *CARAL Case Former* will do the same for *you!*

Write today!
Details sent immediately!

CARAL PACKAGING MACHINERY INC.

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For more information circle No. 255 on Reader Service Card, Page 85

cartons each contains. These are designed for quick reading, even when boxes are stacked to the ceiling of our storage area.

Pallet loads of these **boxes move by fork-lift truck from the carton plant to storage and from storage to our packaging lines.** We can stack to ceiling height and thus use all available space, as well as the full capacity of the handling equipment.

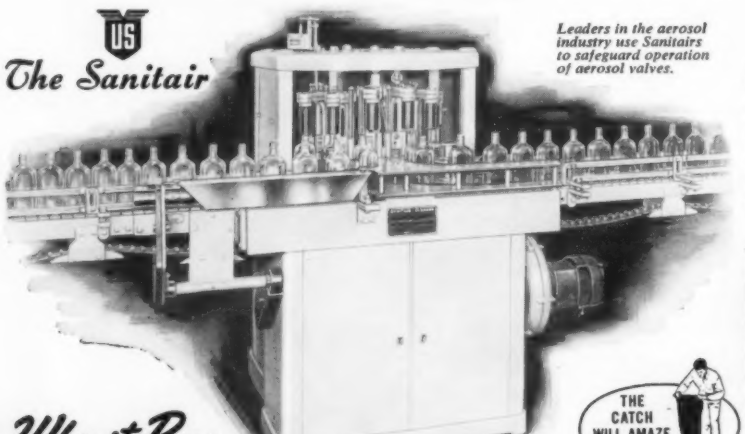
At points of use these **wood boxes are removed from pallets and positioned on the floor.** After removing lids, attendants and stock handlers **transfer cartons to packaging machinery** just as from other kinds of containers, such as bundles or corrugated boxes.

It is hard to measure the value of a trouble-free operation, but, by minimizing opportunity for damage to cartons, **we have reduced stoppages on our lines due to cartons jamming or malfunctioning.** We are convinced the box and labor cost involved is more than justified. (*End*)

US

The Sanitair

Leaders in the aerosol industry use Sanitairs to safeguard operation of aerosol valves.



THE CATCH WILL AMAZE YOU

Why it Pays

TO REMOVE FOREIGN MATTER FROM NEW CONTAINERS

Packaging engineers demand it as indispensable to quality control. Merchandising managers demand clean containers for profitable consumer relations!

Air-Cleaning costs so little . . . the lack of it can cost so much. Once a Sanitair is synchronized into the production line, its operation is entirely automatic. Containers are completely inverted, *before, during* and *after* the air tubes enter, assuring positive cleaning. Has automatic operating safeguards. Speed is adjustable to line operation. Container changeover for all sizes including wide-mouth finishes. Exclusive, patented features. For complete details, write for the "Sanitair Bulletin."

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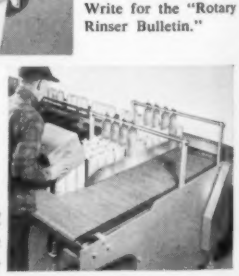
The E-Z Air Cleaner

for semi-automatic air cleaning of new containers of any size or type. Containers are manually inverted over air valves, two at a time, up to 40 per minute. Write for the "E-Z Bulletin."

For rinsing bottles or jars, ounces to gallons as illustrated. Rinses both inside and outside with water or steam. Write for the "Rotary Rinser Bulletin."

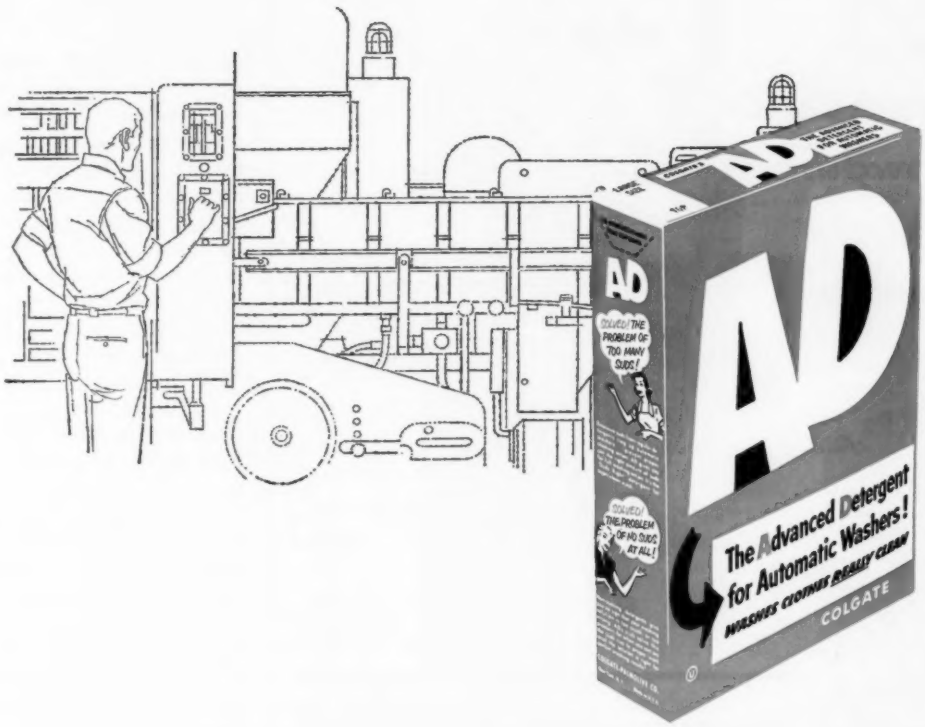


To Feed Containers Faster

THE U. S. CONTAINER FEEDER feeds containers to the packaging line faster, easier, at a steadier pace and a lot cheaper! Just dump 'em on, and let the feeder take charge. Pays for itself quickly and reduces costs permanently. Write for a "Container Feeder Bulletin."

Easi-Clean RESIN ADHESIVE

FROM THE NEW CHEMISTRY OF ADHESIVES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SOLVED! THE PROBLEM OF TOO MANY SUDS!
SOLVED! THE PROBLEM OF NO SUDS AT ALL!
The Advanced Detergent for Automatic Washers!
WASHES CLOTHES REALLY CLEAN
COLGATE

ELIMINATES SCRAP AND SIFTER LOSSES

EASI-CLEAN lowers packaging costs by increasing efficiency in carton sealing and forming. Improves adhesion. Eliminates pop-ups and sifters. Avoids scrap and product losses. Permits maximum machine speeds. Increases adhesive mileage.

EASI-CLEAN runs as easily as ordinary adhesives. As long as a week without cleanup. Washes off with water. Forms no insoluble skin in the glue pot. Doesn't build up on rollers.

EASI-CLEAN is now in widespread use for carton sealing and forming. A trial run will quickly demonstrate its resin-adhesive advantages. We'd be glad to help. Write or call your nearest National office, telling something of the use you have in mind.

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High speed, automatic BARTELT filler

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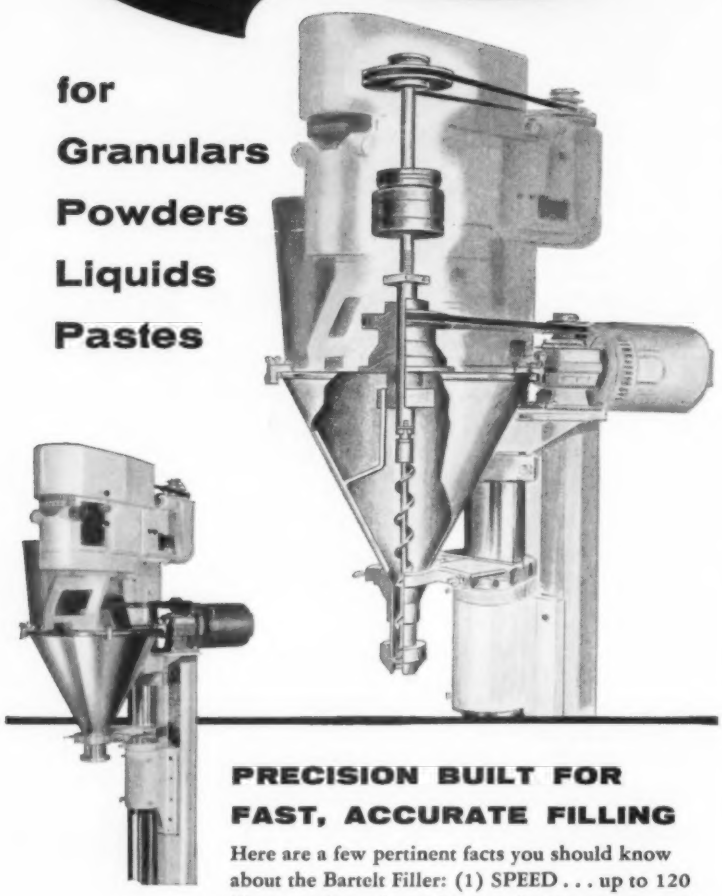


PRECISION BUILT FOR FAST, ACCURATE FILLING

Here are a few pertinent facts you should know about the Bartelt Filler: (1) SPEED . . . up to 120 fills per minute depending on the fill qualities and characteristics. Split fills can more than double this speed. (2) ACCURACY . . . variation no more than 3% (plus or minus 1½%) on most products. (3) VERSATILITY . . . *One* Bartelt Filler will handle granulars, powders, liquids, and pastes by means of interchangeable tooling. It can be applied to all types of operation . . . from hand lines to automatic packaging machinery. Fill quantities can be varied from one gram to five pounds.

Write Today for NEW Filler Catalog

BARTELT ENGINEERING COMPANY
1900 Harrison Ave., Rockford, Ill. • New York Office: 370 Lexington Ave. NYC

Rolling on labels speeds production

(Continued from Page 34)

ment has two idler rolls upon which the bottle rests, but the roller *over* the bottle is *not* powered. The driving force comes from a roller *beneath* one of the idler rolls on which the bottle rests. As the top idler roll moves down to rest on the bottle, its carriage forces a lever arm to raise the driving roller to contact one of the idler rollers on which the bottle rests; the bottle is thus spun around and the label is applied. (See Fig. 7.)

Both of these attachments may be removed from the labeling equipment without impairing its normal operating capacity. These two devices have not sacrificed bottle size and label size versatility. Bottles and cartridges ranging in size from 1 to 20 cc. can be labeled with their identifying tags runrning in size from 1-9/16x3/4 in. to 4-7/32x1 in.

This equipment uses either cold or thermoplastic adhesives and it regularly attains running speeds of around 48 bottles/min. Full wrap-around labels, tear-strip labels, etc., can be applied with equal facility on this equipment, thus maintaining the high degree of versatility which is necessary in the packaging of short-run production of pharmaceuticals.

This operation is far easier and faster than labeling bottles and the like by hand. Also, as in the turret tube-labeling operation, production is geared to product demand, thus realizing some of the economies previously discussed.

With these various home-built attachments for its packaging equipment, Upjohn has made the work of its employees easier and safer, has upgraded the quality of the finished package, and has lowered costs in several areas. These are practical, down-to-earth developments—the sort of things that lead to more efficient production and better consumer service through maintenance of high-quality packaging. *(End.)*

Numbering of aluminum alloys and chemical composition limits of several wrought alloys

ALUMINUM AND ALUMINUM ALLOY GROUPS

(Grouped by major elements)

Major Alloying Element	A A Number
Aluminum — 99.0% minimum and greater	1xxx
Copper	2xxx
Manganese	3xxx
Silicon	4xxx
Magnesium	5xxx
Magnesium and silicon	6xxx
Zinc	7xxx
Other elements	8xxx
Unused series	9xxx

Wrought aluminum and wrought aluminum alloys are designated by a four-digit index system. The first digit indicates alloy groups. The last two digits identify the aluminum alloy or the aluminum purity. The second digit indicates modification of the original alloy or impurity limits.

CHEMICAL COMPOSITION LIMITS FOR WROUGHT ALLOYS

(Composition in per cent; maximum allowable unless shown as a range)

									Other Elements	
Alloy*	Aluminum	Copper	Iron	Silicon	Manganese	Magnesium	Zinc	Chromium	Each	Other
1100	99.0 min.	0.20	†	†	0.05	-	0.10	-	0.05	0.15
1145	99.45 min.	-	-	-	-	-	-	-	-	-
3003	Remainder	0.20	0.70	0.60	1.0-1.5	-	0.10	-	0.05	0.15
2024	Remainder	3.8-4.9	0.50	0.50	0.3-0.9	1.2-1.8	0.10	0.10	0.05	0.15

*No nickel or titanium in alloys listed.
†Iron plus silicon — 1.0% maximum.

retail food store, to determine corrosion potentials of commonly used foods at refrigerator temperatures. They were removed from the cans, repackaged in bare and coated Alloy 3003 containers and stored for 1 mo. at 40°F. Results showed coated Alloy 3003 containers to be satisfactory with all foods tested. Bare Alloy 3003 containers were found to be satisfactory with:

asparagus	grapefruit
lima beans	peas
carrots	potatoes
sweet cherries	spinach
corn	tomatoes

†Rinsed in salt water to retain color.
‡This is the only evaluation in which peas were found to be corrosive to aluminum.

Containers with a protective coating are necessary for the successful storage of:

apple sauce	pears
green beans	pineapple
cranberry sauce	raspberries
peaches	strawberries

These foods perforated their bare containers. Results are tabulated in Table II.

It should also be mentioned that the pH, or degree of acidity, has a significant effect on corrosion potential. Of general interest and information are the pH ranges in Table III.

Test III. In a third test, foil containers fabricated from bare Alloys 1145 and 3003 and coated Alloy 3003 were packaged with 29 fruits and vegetables, and stored at 15° and 0°F. The fruits and vegetables were prepared in accordance with accepted commercial procedures using preservatives and condiments when specified.

RESULTS OF TESTS

Table IV shows results of studies made of the comparative corrosion performance of Alloy 3003 versus 1145. Alloy 1145 appears to be slightly superior to 3003 in resisting corrosive attack (from foods tested) which resulted in perforation. However, Alloy 3003 appears to be slightly superior to 1145 in resisting staining and etching by these same foods.

In the writer's opinion, if a packer specializes in a small number of food items, it would be advantageous to determine the alloy most resistant to the specific foods it packages. However, the difference in corrosion resistance of the two alloys is not tremendous, and the convenience value of using one alloy would negate the value of using specific alloys for specific foods for the packer of a large group of foodstuffs.

Shelf Life Varies With Storage Temperature

The shelf life of bare containers holding corrosive foods varies with storage temperatures. At 0°F., huckleberries (the most corrosive food tested) have a shelf life of approximately 6 mo. Blueberries and mushrooms have a shelf life of approximately 10 mo. The shelf life of bare containers holding other foods tested is more than a year. (See Table V.)

The shelf life of filled containers stored at 15°F. cannot be considered from a practical viewpoint, because storage at this temperature results in considerable loss of food quality, and, in some cases, the food has been found to be moldy and spoiled. However, testing fro-

(Continued on Page 92)

try out

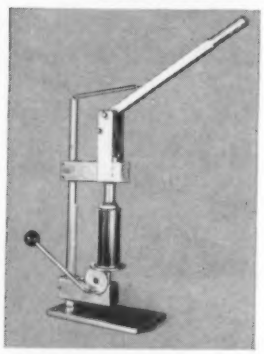
Aerosol Packaging

for only

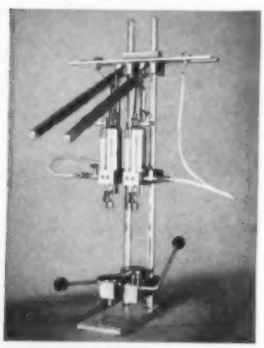
$90 a month!

New Rental Program lets you test your own formulations, with KARTRIDG PAK laboratory equipment, in your own plant.

All you need to get started are...



THIS Valve Crimper which seats the valve and seals the can. (Rental $25 per month; with vacuum attachment $37 per month.)



AND THIS Pressure Filler for injection of liquid propellant, a twin unit that lets you test any desired formulation of two propellants. (Rental $65 per month.)

Thinking about an aerosol package for your product? Test it yourself under Kartridg Pak low-cost rental program!

Kartridg Pak, first in aerosols and largest builder of complete packaging lines, will rent necessary laboratory units for as little as $90 a month.

Leading suppliers of cans, bottles, valves, and propellants will gladly cooperate in your test program.

The two manual units pictured are, in most cases, all you need. For more extensive testing, the following units are also available at these low monthly rentals (which may at any time be applied to purchase price):

- Cold Filler, $200
- Valve Crimper for bottles, $35
- Propellant Filler (low pressure), $10
- Nitrogen Gasser, $30
- Water Bath (test for leaks), $45
- Tumble Gasser (propellant dissolver), $105

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THE KARTRIDG PAK CO.

Dept. H., 9151 W. Fullerton Ave., Franklin Park, Ill., Telephone NAtional 5-8270

Effective layouts for today and tomorrow

(Continued from Page 50)

the first vacant spot they see) will not store it next to steam pipes. You may want a humidified space for crating-shooks, a dry one for corrugated boxes.

Watch Your Work Methods

But damage and loss prevention hinges on more than space allocation. To the cost-conscious layout man, it again involves handling methods. If you handle flour in 100-lb. bags, some of the product is bound to be lost when bags drop or get torn. If your volume permits bulk handling with bins or piping, you have a chance to cut this loss and save more flour to be put, in one form or another, into your own package.

If parts are brought to the packaging station on trays, there is always the chance of spilling or dropping them. A layout that includes conveyors enables you to protect these parts from such risks. In fact, it may become a link that integrates production, assembly, and packaging operations. Conveyors, properly laid out, save handling costs and safeguard the product.

Use Simplest Transfers

We have mentioned protection from contamination, degradation, loss, and damage. Influencing all these is the general flow of materials through your plant. **If you control this flow right through the packaging operation, you are hitting potential losses on the chin.**

This means getting things to their destination by the most direct route, avoiding cross-traffic. You should not haul crating lumber through the department where final inspection occurs—but, unless you *plan* your flow, you may find this happening. Examples of good practice include factories where packaging materials are stored on the floor above and directly over the point of use.

Containers are conveyed to the entry of the packing line. Jar clo-

sures drop to the capper from a hopper upstairs. Cases decline to the case-packing machine on conveyors from another section of the upper floor. Each material has its own segregated storage immediately above the point where it is to be utilized. No material, therefore, can be damaged by the handling of another.

5. MAXIMUM FLEXIBILITY

After all this talk about specific objectives, one general point merits attention: maximum flexibility.

It is possible to engineer a layout that seems perfect for the most modern, up-to-date operation, but it will not stay that way. Being merely up-to-date is no longer adequate. **Rather, today's layout must be capable of handling, with minimum conversion expense, tomorrow's packaging.**

Saving space does not mean tight packaging lines cramped into corners of the building. Saving space does mean doing current jobs in the fewest square feet possible to assure more room for other purposes.

Suppose you have your packaging operations all laid out. Stand back and take a look at your plan. Have you plenty of room for mechanics, roving inspectors, and supervisors to get about in? Are your aisles between lines big enough to permit removing or replacing a piece of equipment? And how about visitors? Will they be able to see what's going on?

Keep Future Needs In Mind

More than this, is there enough space for the future? You are in what is probably the most rapidly mutating, evolving, churned-up, undecided, innovation-minded sector of industry. If you don't think so, compare your own company's package of today with that of five years ago—or one year ago, for that matter.

Your layout is good only if it is flexible. It has to be capable of doubling its production volume. It has to be able to accommodate

(Continued on Page 92)

WHICH MARK IS YOURS?

M.S.M. CO.
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NEW YORK
Bold, stencil marking complies with Marking Rule 6.
Tiny, typed address is difficult to read.
MARSH STENCIL MACHINE

FOUR SIZES:
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"FREIGHT MUST BE STENCILED or otherwise durably and plainly marked" reads Rule 6, Marking Freight.

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PLAINLY MARKED—can you read the address at 10 feet?

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Careless marking costs shippers millions of dollars yearly, say railroads and truck lines. Proper marking would save this.

Try the Marsh Stencil Method on your shipments one week free. **Write for sample stencil of your name and 24-page booklet on proper marking.**

MARSH

MARSH STENCIL MACHINE CO.
BELLEVILLE 34, ILL.

Pin to letterhead and mail for free booklet and sample stencil of your name.

NAME_____

TITLE_____

For more information circle No. 260 on Reader Service Card, Page 85

ANNOUNCEMENTS OF MACHINERY AND PRODUCTS

● Beneath each announcement is a code number. As you select items on which you want more information, *note* this number. ● Now, *circle* the corresponding numbers on the postcard, Page 117. ● Next, *fill* in your name and address. ● Then, *mail* the card — we pay the postage.

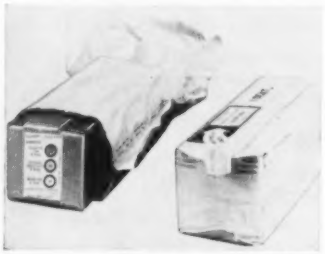
● Blister Sealing Unit

Tronomatic Machine Mfg. Co. introduces its Blistomatic machine that heat seals through the card rather than through the plastic. The flat, steel, blister-laden loading tray is engaged by a master plate against the hot die for sealing, practically

forcing the plastic into the card. The plate's ability to absorb heat, permits operating at a higher temperature without danger of deforming the plastic blister or causing excessive card warpage, according to Tronomatic.
Circle No. 1.

● Humidity Indicator Card

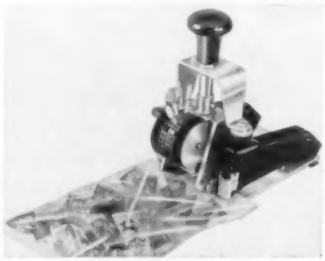
Culligan, Inc. now has available a new low cost humidity indicator card for general packaging use.



Called the Humi-Card No. 693470 it meets recently issued military specification MIL-1-8835 and military drawing MS20003-2. Both cover humidity-sensitive cards principally for use in the preservation and packaging of equipment and supplies in accordance with Method II of specification MIL-P-116C. Card measures 2x3 in., has three vertical spots indicating relative humidities of 30 per cent (bottom), 40 per cent (middle), and 50 per cent (top). Eyelets for mounting are provided in the center top and bottom of the card.
Circle No. 2.

● Stapler And Bag Pricer

General Marking Equipment Co. has produced a stapler and bag pricer that twin-staples and prints prices directly on all types of bags and wrappings in one operation. Lever controls set copy and lock it into position for precise and continuous printing. Type wheels are made of heavy gauge steel. Uses front-loading Bostitch twin-staplers. Stapling



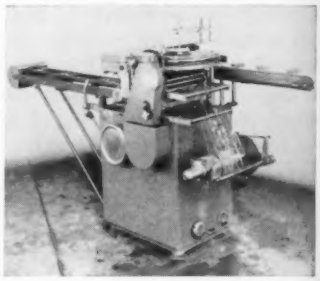
and printing is achieved by a down-and-up hand movement.
Circle No. 3.

● Temperature Controller

West Instrument Corp. has developed a proportioning controller called the Model JP, that adjusts the ratio of power, on-and-off, automatically, maintaining a desired temperature over a given period of time. It is claimed this controller gives more uniform heat-sealing of plastic cellophane packaging materials.
Circle No. 4.

● Candy Wrapper

Crompton & Knowles Packaging Corp. has produced a candy overwrapping machine, known as the Model CKDW2, that will wrap round, square, rectangular, and other shapes of candy products, one



after another, at speeds up to 85 pieces/min. The machine handles such films as heat-sealing cellophane, foils, glassines, and heat-sealing waxed papers, and occupies 27 sq. ft. of floor space.
Circle No. 5.

● Paper Profile Recorder

Testing Machines, Inc. announces the development of its new, sensitive, micro recording profiler that is designed to provide chart readings of complete cross-web thickness variations, and machine-direction thickness, in increments of 0.00002 in. Adjustable friction rollers, coupled to a constant-speed motor, pull a test strip of paper between two flat anvils. Feed rate of test sample is 30 in./min. Sample size can be 8 in. or less in width.
Circle No. 6.

● Bag Cleaning Machine

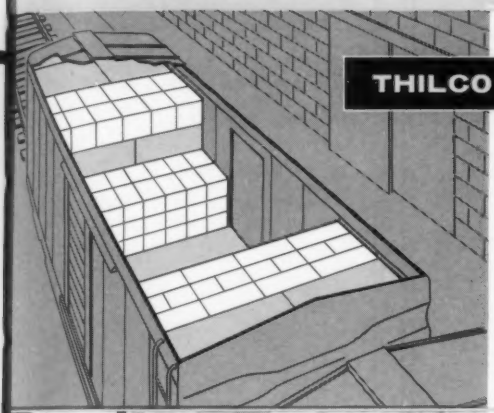
Bemis Bro. Bag Company has developed a bag cleaning machine designed to apply a thermoplastic tape closing over sewing on open-mouth multiwall shipping sacks. The machine first makes a standard sewn closure, then tape is folded and creased over the stitches and heat-sealed under controlled temperature and pressure, creating a moisture-barrier to prevent caking of hygroscopic products. The tape's

Circle No. 261 on Card, Page 85 ►

Cut Shipping Costs by the CARLOAD

with these THILCO

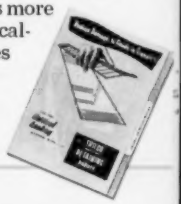
Heavy-Duty PROTECTIVE Papers



THILCO RETAINING PAPERS

For Unitized Loading in Boxcars

Unitized Loading with Thilco WRAP-DRI (Asphalt Laminated) and THILCO-TUF (Blonde Laminated) Retaining Papers is a most effective method for stopping costly "load shifting" damage to bottled, canned or packaged goods in transit. Thilco Retaining Papers tighten boxcar loads and keep them intact under repeated impacts without severe shifting. Load ride is more stable and any wet damage from broken bottles is localized in the car. Write for Brochure containing samples of Thilco's economical line of Plain, Creped and/or Reinforced Retaining Papers for unitized loading.



THILCO CAR LINING PAPERS

Safeguard Against "Leaky" Cars and Wall Scuffage

Thilco's high quality WRAP-DRI and THILCO-TUF papers make even the "leakiest" boxcar batten-tight against damaging rain seepage. Scuffproof, they protect unit loads from the abrasive action of car walls and floor due to load shifting . . . cut costly product losses from bags worn-through in transit. Paper's tough strength permits mechanical loading — does not easily tear or puncture even under the spinning wheels of fork lift trucks. Available in widths up to 10 feet in Jumbo rolls, or in any pre-cut length sheeted rolls desired. Write for complete information.

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Thilco's wide range of economical Protective Covering Papers makes possible the shipment of many more types of products on flat and gondola cars. Heavy-duty papers of waterproof Asphalt Laminated and/or Black Poly-Coated Reinforced Kraftts, they provide full protection against all kinds of weather and corrosive elements for an entire carload or unit shipment. Available up to 10 ft. wide in rolls, or pre-cut to any length in time-saving sheeted rolls. Can also be trade-mark decorated for product advertising. Write for samples and complete information.

THILCO PAPERS INCLUDE:

- **WRAP-DRI** Waterproof protective papers
- **THILCO-TUF** Stainproof laminated papers
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- **POLY-COATED** and special treated papers
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- **GLASSINE** and greaseproof papers
- **SPECIAL BAGS** and case liners

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Functional Papers

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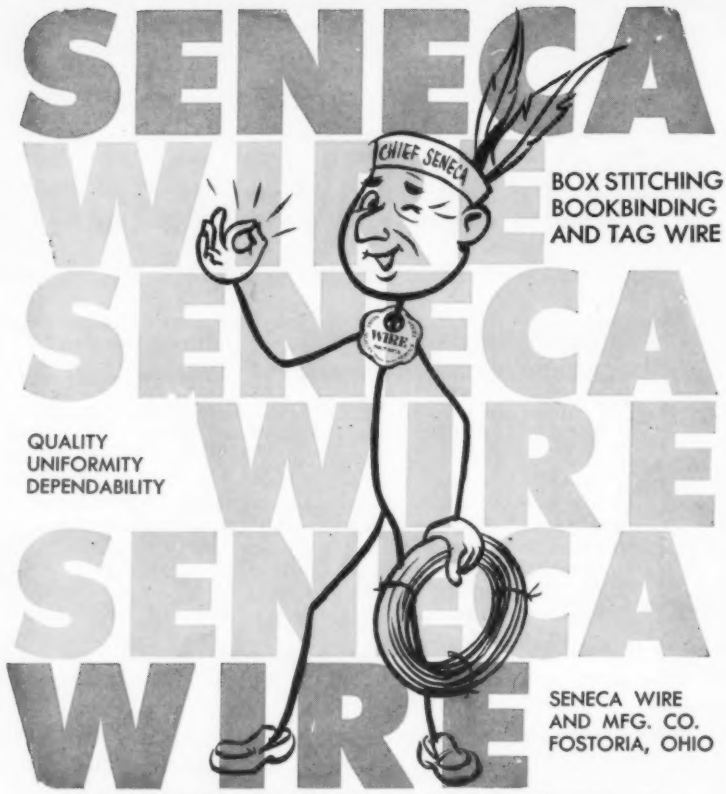
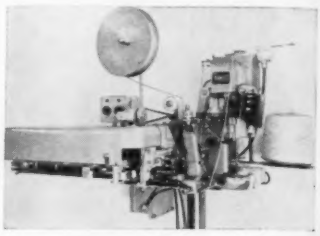


For more information circle No. 262 on Reader Service Card, Page 85

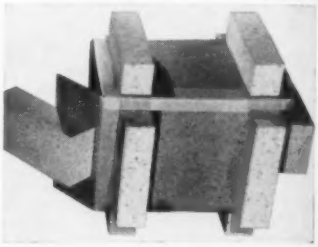
physical and chemical characteristics are unaffected by temperatures of bagged products. The machine



has automatic starting, thread cutting, and tape application and cutting components.
Circle No. 7.

● Packaging Foam

Leewood Corporation announces a new high-density polyurethane foam



called Leefoam, which is supplied as part of custom suspension pack-

BIVANS CORPORATION

2431 Dallas Street, Los Angeles 13, California
Contact our distributor: New Jersey Machine Corp., Hoboken, Cincinnati, Chicago, Los Angeles

For more information circle No. 263 on Reader Service Card, Page 85

ages or separately as corner pads or blocks. Manufacturer claims the material is resistant to shock impact, vibration, and is non-abrasive. Also that it serves a wide range of static loading, performing from 0.5 to 2.0 psi.
Circle No. 8.

● Tape Dispensers

Minnesota Mining and Manufacturing Co. introduces a line of air-operated tape dispensers for large volume taping. Called Scotch, portable machines automatically dispense pressure-sensitive tape to preset lengths. Available in 14 different models, grouped in four series: 802-, 822-, 852- and 922. Machines weigh from 22- to 74-lb. with four different type valves, says manufacturer, A-, AS-, AT- and AE. A- is an air valve activated by foot pressure; AS- an air solenoid valve, activated by foot, hand, arm, knee or conveyed product; AT- air-operated valve with time-delay switch and activated by finger pressure that causes automatic dispensing of tape; AE- air electric valve activated by removing a strip of tape from machine. This triggers a switch that causes automatic and complete tape delivery.
Circle No. 9.

● Coated, Bleached Board

West Virginia Pulp and Paper Com-

SUS-RAP

proven preformed material

"STEP BY STEP"
ENGINEERED PACKAGING

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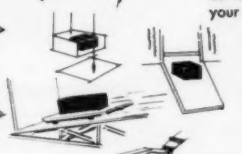
We believe that proper packaging is the complete evaluation of all factors involved. Vanant considers cube and tare reduction as important as material and labor savings in evaluating your total package.*



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We maintain an approved National Safe Transit Testing Laboratory. In the lab are complete testing facilities and actual test shipments are also done in many cases.

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. . . excerpts from actual letters in Vanant Company's files: "It has proved to be the most economical design we have used so far" "We were able to reduce the cost of our packaging by about 80%" "We know that Sus-Rap has reduced our labor costs by at least 50%"

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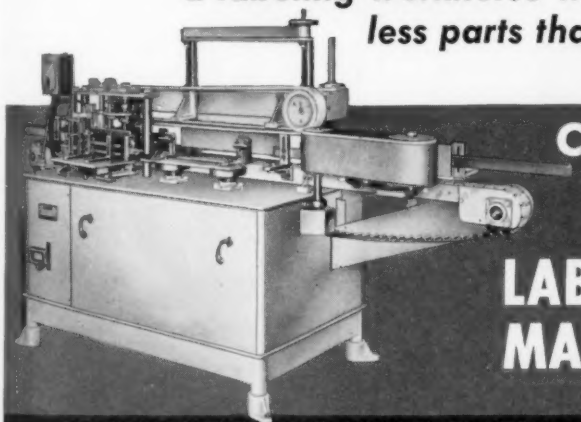
a labeling workhorse with less parts than any semi-automatic machine



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Fully Automatic
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GREATER FLEXIBILITY THAN EVER BEFORE POSSIBLE

PRODUCTION variable speed drive from 40 to 150 per minute.

LABEL RANGE "postage stamps" to 6" wide by 7" long.

LABEL MATERIALS foil, paper, plastic, etc.

CHANGEOVER TIME approximately 15 minutes

CONTAINER RANGE 1½" high by 1" diameter through 14" high by 7" diameter.

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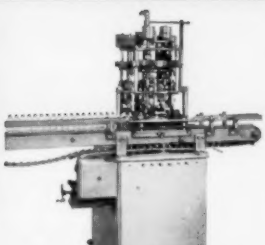

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LIQUID FILLING MACHINES

Fully automatic Overhead drive in vacuum, gravity and volumetric types. Models from 8 to 40 spouts handling all types of foamy and still liquids — for glass, metal or plastic containers from fractional ounce to gallons. Also semi-automatics and custom-engineered models.

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191 Berry Street Brooklyn 11, N. Y.
Manufacturers of a complete line of fully automatic and semi-automatic liquid filling and labeling equipment.

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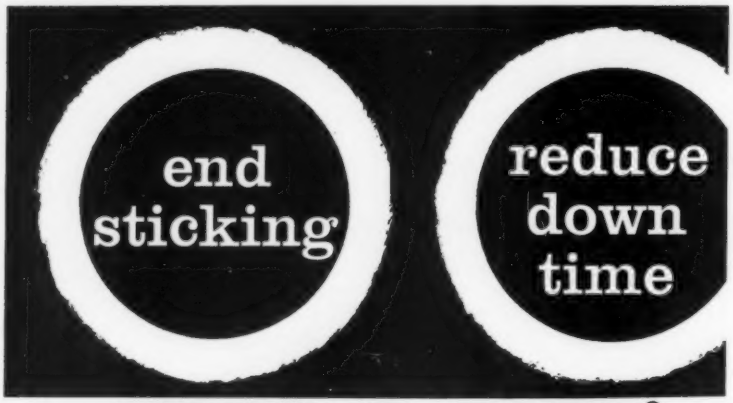

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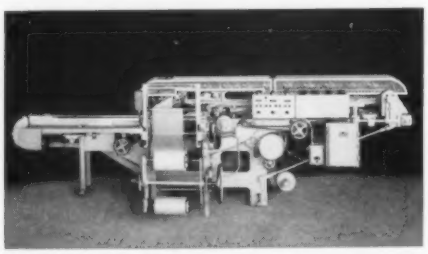
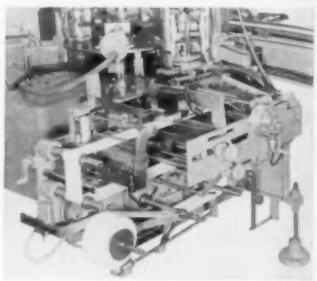


BATTLE CREEK'S NEW 51-CR WRAPS UP TO 130 FRACTIONAL PACKAGES PER MINUTE! A new high speed wrapping machine has been perfected to produce from 90 to 130 fractional packages per minute. Handles Cellophane (with or without polymer coatings); waxed glassine; or laminated foils. Converts quickly to the usual fractional package sizes, viz: square sodas, rectangular grahams, or rectangular sprayed crackers; in flat stacks. Can be equipped with pin type loaders. Forms a tightly contoured, snug overwrap that assures freshness and flavor retention. In spite of the high speed, the crackers are handled gently through all feeding and wrapping operations. **Battle Creek *"Continuous Flow"* Packaging Machines, Inc., Battle Creek, Michigan.**

pany has developed a high yield bleached board, called HiYield Printkote, with a coated surface, for printing. The producer claims this board, made of 100 per cent virgin bleached fibre, will enable package users who are now using non-virgin fibre printing boards, including some of the lowest grades, to upgrade to cartons that are all white inside and out. It is further asserted the board yields more cartons per ton than higher density boards and compares in packaging cost to cartons made of non-virgin fibre.
Circle No. 10.

● Roll Feed Labeler

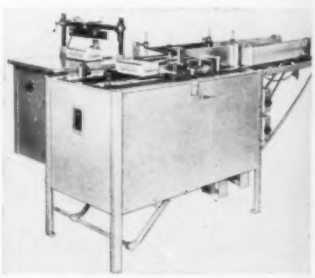
New Jersey Machine Corp. announces a new attachment as part of their Pony Express labeler, that



handles labels in continuous form. It is the first labeler to be offered with the option of labeling in roll form with the use of a roll feed attachment, that code numbers and imprints while the label is still in the web. Manufacturer claims labels in roll form, provide the drug industry and large volume packers with automatic label verification, plus the opportunity to use lower cost gravure-printed labels.
Circle No. 11.

● Semi-Automatic Wrapper

Elgin Manufacturing Company has unveiled two semi-automatic machines for wrapping up to 15 pack-



ages/min. The first unit is called EZB and is engineered to handle polyethylene and other limp films for a variety of products where limited production of rectangular, square products, cartons and flat packages is demanded, Elgin says. The machine is 54- x 78 in., motor driven and operates from a foot treadle control. By turning a handle,

Give your product a lift with a

WHIZ-LIFTER

MATERIALS ELEVATING MACHINE — Assures speedy, automatic bulk product elevating into hopper of a weighing or filling machine without danger of spillage or breakage! Will handle drugs, hardware, pharmaceuticals, plastics, chemicals, etc., with trouble-free efficiency.

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Circle No. 268 on Card, Page 85

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BETTER PACK 555 - ELECTRIC

Fastest gummed tape sealer! Feather-touch key feed! 5 operations in 1 second — electrically! Selects, measures, moistens with hot water, cuts and delivers **any** gummed tape with effortless speed of heavy industrial shipment-sealing equipment... at a fraction of the price. Ask for Proof-Demonstration without obligation.

Better Packages, Inc. 253 Canal St Shelton, Conn.

Name_____

Company_____

Address_____

City_____ Zone____ State____

Circle No. 269 on Card, Page 85

it is adjustable for underfolding, overwrapping and heat-sealing. The second model, called EZA, is designed to handle cellophane, foils and wax paper, and occupies 20- x 40 in. floor space. Slightly less than the EZB.
Circle No. 12.

● Non-Skid Coating

Adhesive Products Corp. has announced a new palletizing non-skid coating for bags, corrugated boxes, beer cases and other containers, called Skid-Not. It is a concentrated liquid coating which can be diluted with water and sprayed directly on the container. The amount of water added determines the amount of skid-proofing attained. Dry Skid-Not forms a non-skid surface which permits stacking and handling of bags and boxes without fear of sliding. Dry or diluted, the manufacturer says Skid-Not is waterproof and oil-resistant.
Circle No. 13.

● Can Lid Clip

Anchor Chemical Co. offers a new can lid clip as an alternative to the soldering of lids to cans sent

through the mail. The clip is installed with thumb-press or hammer-stroke and is removed with the twist of a screw driver. Clips fit standard type cans up to 1-gal. capacity and permit opening and resealing without damage, says Anchor. Clips are now available in three sizes: G-12 for gallon cans, Q-6 for pint and quart cans, and P-3 for pint and lesser can sizes. Postal rulings declare eight clips must be used on gallon cans, six on quart cans, and four on pint cans.
Circle No. 14.

● Compression Tester

Gaynes Engineering Co. announces a new compression tester 2CT10-468, capable of exerting 10,000-lb. pressure. Platens are 48 in. wide x 72

PROXMELT®

• **PROXMELT** molten laminating adhesives yield economical, fibre tearing, grease and moisture proof combinations when used to attach glassine, greaseproof, foil, films, and parchment to boxboard.

• **PROXMELT** adhesives and laminating compositions are available both "ready to use" and as concentrates which are added to paraffins, micros, and resins. You need no costly dispersing machinery or high temperature apparatus to successfully employ Proxmelts in the fabrication of cookie caddies, detergent cartons, cannister caps, etc.

• **PROXMELT** is applied at moderate temperature; conventional laminating, pasting, and waxing machines are readily adapted to apply Proxmelt. Write or phone the nearest Pyroxylin office for list of concentrates, starting formulas, and technical assistance.

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PAOLI, PENNA.
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Pyroxylin PRODUCTS, INC.

Circle No. 270 on Card, Page 85

A message to

Package research and development departments
Engineering departments
Technical and research libraries
Everyone concerned with what is being written in the world of packages

Last month, we announced that we had been appointed American agents for *Packaging Abstracts*, published by the British research association PATRA—The Printing, Packaging & Allied Trades Research Association. This service gives you, in a single, handy periodical (published monthly, plus an annual index), brief summaries of packaging articles that have appeared in some 200 packaging magazines plus over 150 magazines devoted to printing and allied subjects, and numerous patents, books, pamphlets, and technical data provided by makers of machinery and materials.

This publication is unlike any other abstracting service in the world. It covers technical and operational packaging; it abstracts not only English language periodicals, but translates and abstracts foreign language publications from Germany, Russia, France, and every country in the world that publishes periodicals concerned in whole, or in part, with the various phases of packaging.

At present, each issue is divided into 18 main sections, including among others such subjects as packaging materials, adhesives, labels, coatings, and packaging machinery.

How To Use *Packaging Abstracts*

Suppose you are interested in finding out what has been written on cushioning. You would refer to the section on cushioning. A recent issue abstracted seven articles on the subject, that had appeared in one American magazine, two British, one Canadian, and two U.S. military reports. Perhaps the abstract would give you the information you want; if not, you could request a complete reprint or copy of the original publication. The same issue, for instance, abstracted 13 articles on plastic containers. An average issue carries about 400 abstracts based on literature received from all parts of the world.

The Cost Is Nominal

It costs thousands of dollars to collect, translate where necessary, evaluate, and abstract pertinent articles. Each month, literally thousands of pages of editorial material are read and the final result put into a handy 5½x8½-in. booklet averaging around 75 pages a month, plus the annual index. You can receive the 12 monthly issues plus the annual index for a total annual subscription price of only $42.00.

Examine It 10 Days Free

Just mail the sample subscription form shown and we will mail you a sample copy of the January 1960 issue. You may return it in 10 days and you owe us nothing. If you keep it, we will mail you the February issue and subsequent issues as they come off the press, and bill you $42.00 for a one-year subscription.

Free Examination Form

PACKAGE ENGINEERING
185 N. Wabash Avenue
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Gentlemen:

Please send me a copy of *Packaging Abstracts* for 10 days' free examination. I understand that I may return the copy in 10 days and I owe you nothing. If I do not return it, you may bill me $42.00 for a year's subscription.

Name _____ Title _____

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in. long, with maximum distance between 96 in. Two heavy duty screws raise or lower the top ground platen to apply force to the test load. An AC-DC generator-type drive motor enables the tester to achieve varying speed down to 0.100 in./min. The moving platen has gauge and pointer for fast setting to test height, and is distance-controlled by adjustable double limit switches. Electronic weighing and recording is made by using a load cell system electrically connected to an electronic recorder. As force is exerted, a pointer on the recorder indicates the pressure applied, and a writing pen makes a permanent record showing the pressure vs. deflection curve on a synchronized chart.
Circle No. 15.

● Portable Liquid Filler

National Instrument Company recently introduced a portable liquid filler called the Filamatic Model DAB-16 that will fill containers up to 32-oz. in size at an adjustable speed of from 3- to 30 fills/min. The unit utilizes two volumetic type 16-oz. capacity piston pumps operating in tandem, each adjustable to dispense from 1½- to 16-oz. per stroke. Model can be used as semi-automatic, with operator inserting the nozzles into the containers by hand, or automatic with conveyor.
Circle No. 16.

POST DECITRON ELECTRONIC PRODUCTS

Post's Miniature Photo-heads solve the problem of mounting a sensing device in a limited area. Hardly larger than a standard paper clip, these photosensitive, semi-conductors may also be used as a reflected beam photohead.

Average light source life is 5,000 hours . . . designed for industrial use. Alignment brackets to insure proper relation of light source and receiver are also available.

Decitron

POST ELECTRONICS

Division of Post Machinery Co. | 163 Elliott St., Beverly, Mass.

For more information circle No. 271 on Reader Service Card, Page 85

NOW . . .

PUT GLUE EXACTLY WHERE YOU WANT IT!

. . . AND SAVE UP TO 83% WITH FF GLUE GUNS

Regardless of your gluing needs . . . spotting, rolling, striping, doweling, etc. . . . you can incorporate new Internal Valve FF Glue Guns in your automatic machines . . . existing or new! Over 400 sizes, models to choose from . . . with each unit designed for fast, clean gluing without waste. Easy installation. Guaranteed. Send for your catalog on this marvelous way of "Controlled Gluing". Oh yes . . . FF Guns can be used manually . . .

JOHN P. FOX COMPANY, INC.

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Select areas open for agents and distributors

Circle No. 272 on Card, Page 85

NEW! Portable Electric Bag Closing Machine

HERE is a handy little machine that makes bag closing fast, easy, and economical. It is recommended where operations are limited or intermittent and do not justify installation of large, high production machines.

LIGHTWEIGHT—9½ pounds. Carry it anywhere. No installation; requires only an electrical outlet.

POWERFUL—Direct drive motor with thumb control button. Exclusive top and bottom feed for greater power and production.

VERSATILE—Closes bags made of cotton, burlap, jute, multiwall paper, laminated paper.

SAFE—Anyone can operate it. No special training required. Comes with shoulder strap or can be obtained with overhead suspension. Send for descriptive literature.

Union Special® MACHINE COMPANY

Originator of Filled Bag Closing Machines

487 North Franklin Street Chicago 10, Illinois

Circle No. 273 on Card, Page 85

INDUSTRY LITERATURE AVAILABLE FREE

■ Beneath each item there is a code number. As you select items on which you want more information, *note* this number. ■ Now, *circle* the corresponding numbers on the postcard, opposite this page. ■ Next, *fill* in your name and address. ■ Then, *mail* the card — we pay the postage.

■ Aluminum Foil Packaging
Reynolds Metals Co. offers a folder compiling a series of 24 laboratory reports describing the characteristics and uses of aluminum foil as a packaging material. Some of the subjects covered are: aluminum foil as a gas barrier, insulator, light barrier; vitamin retention, cook-in packages, developments in overwraps.
Circle No. 101

■ Self-Sticking Tape
Permacel-Lepage's, Inc. has published a 44-page manual of "Practical packaging ideas with Permacel tape." A description of each of 37 packaging tapes is included, as well as illustrated applications of self-sticking tape for carton and box-sealing, wrapping, bundling, bag sealing, canister and drum sealing, combining, palletizing, aperture sealing, and labeling.
Circle No. 102

■ Polyethylene Film
Visking Co., division of Union Carbide Corp. offers an 18-page booklet of technical information on Visqueen film and the polyethylene resin from which it is extruded. The booklet discusses the effects of chemicals on the film's physical properties, its transmission of oils, vapors and light, directional properties; and includes a section on the structure and properties of polyethylene.
Circle No. 103

■ Resin Adhesives
Morningstar-Paisley, Inc. offers information on its Solu-Rez series of low-viscosity, multipurpose polyvinyl acetate resin adhesives. Advantages include suitability on most carton sealing and forming equipment at high production line speeds, bonds on different types of carton surfaces, low viscosity and spreadability, washability of machine parts and reservoirs.
Circle No. 104

■ Corrugated Set-Up Machine
Gaylord Container Div., Crown Zellerbach Corp., offers a 4-page illustrated folder on its semiautomatic set-up machine for corrugated boxes. Machine sets up and produces up to 900 boxes/hr.
Circle No. 105

■ Heavy Duty Heat Sealer
Wrap-Ade Machine Co., Inc. offers a data sheet giving specifications for a pneumatic heat sealer. This machine heat seals bags, pouches, envelopes, barriers, etc., made of kraft and scrim-backed laminates, cellophane, foil, Pliofilm, etc. The unit features automatic control of pressure up to 1,187 lb., dwell up to 15 sec. and heat up to 550°F.
Circle No. 106

■ Automatic Packaging Machinery
Wright Machinery Co. offers a 34-page illustrated brochure presenting data on its bagging and weighing systems, Junior weigher, candy cleaner, electronic weigher and other machinery. The purpose of each piece of equipment, the products it handles, how the machine functions, and the standard specifications for each are included.
Circle No. 107

■ Liquid Fillers
Popper & Sons, Inc. offers Bulletin No. 659F, "Distinctive packages require the right filling equipment," illustrating and describing its variety of filler models. Speeds range up to 240 containers/min.: fills from 1 to 360 cc.; handles plastic and glass containers.
Circle No. 108

■ Vacuum Forming Machine
Comet Industries offers complete information on its vacuum forming machine, the Comet Star. Plastic sheet forming, straight drape and vacuum forming, inverted drape and vacuum reverse, and ring and punch forming are some of its applications. Two counteracting platens are electrically driven and independently controlled. Each has a separate vacuum and airpressure system. Basic operation consists of automatic withdrawal of super-heated plastic sheet from an enclosed oven to molding area. Sheet is evenly heated on both sides. Either or both platens are used depending upon chosen forming techniques.
Circle No. 109

■ Collapsible Metal Tubes
A. H. Wirz, Inc. has a manual devoted to proper selection and use of fold-up metal tubes. This 32-page handbook includes data on such specification factors as tube size, tube openings, tube closures, and tube liners. Selector charts serve as guides in determining the compatibility of various products with such tube metals as aluminum, tin, lead, and special alloys.
Circle No. 110

■ Pails And Drums
Vulcan Containers, Inc. offers an information sheet illustrating its line of steel pails and drums, with capacity ranges of 1 to 12 gal. These containers are available from stock in lined or plain interiors, in a variety of gauges. They are equipped with pouring spouts for both drum and lug styles of cover.
Circle No. 111

■ Automatic Jaw Sealer-Labeler
Doughboy Industries, Inc., has a 2-page data sheet on its automatic jaw sealer, labeler, Model PJS. Head labels are applied and bags sealed in one complete operation for cellophane and coated cello bags, polyethylene, saran, etc. Machine holds bag for the complete sealing cycle, enabling operator to increase production up to 50 per cent, Doughboy says.
Circle No. 112

■ Filling/Packing/Weighing Machine
Arenco Machine Co., Inc. has a 4-page general catalog which briefly describes 17 models of its machines. They include tube fillers and closers, jar and bottle fillers, paste and ice cream fillers, bag packers, closers and sealers, carton and bag makers, bottom gluers, case sealers, check weighers, net weighers, and tablet packaging machines.
Circle No. 113

■ Liquid/Semiliquid Fillers
FMC's Canning Machinery Div. has a 16-page Booklet No. 501E255 on its M & S fillers. Models illustrated run from 30- to 6-pocket machines. Included are several charts; one that groups products handled by typical viscosity classes, such as dog food, petroleum, baby food, etc. Various attachments are illustrated as well as a number of plant operations.
Circle No. 114

covering. A detailed table of specifications gives properties of Tenite polyethylene.

Circle No. 128

■ Polyester Film

Minnesota Mining & Mfg. Co. has issued a brochure listing various applications for its Scotchpak brand heat-sealable polyester films. Described as being transparent as cellophane and flexible as thermoplastics, these polyester films are now being used for the packaging of such diversified products as chemicals and metal hardware, food and paint pigments, detergents and caulking compounds, and the like. The brochure also presents a properties and characteristics chart on the films.

Circle No. 129

■ Multiwall Bag Packaging

International Paper Co., Bagpak Div., has issued an illustrated 4-page brochure, "Complete packaging service," which outlines its line of multiwall bag packing and closing equipment. Specifications and descriptions are included for the machinery, and diagrams of a variety of bag closures that are available.

Circle No. 130

■ Rubberized Hair

Janesville Cotton Mills offers information on Hair-Kore, a cushioning material made of rubberized curled hair. Designed to protect against shock, it is molded to fit and cushion each piece of equipment with, according to the manufacturer, a saving in weight and volume.

Circle No. 131

■ Bag Closers

George H. Fry Co. has a 4-page illustrated folder that gives specifications and operating features of four different models of bag closing machines. These are continuous motion machines that close and seal paper bags up to 3-lb. capacity. It handles bags made of kraft paper, waxed paper, plain or waxed glassine, foil and paper combinations, using either adhesives or the heat-seal method.

Circle No. 132

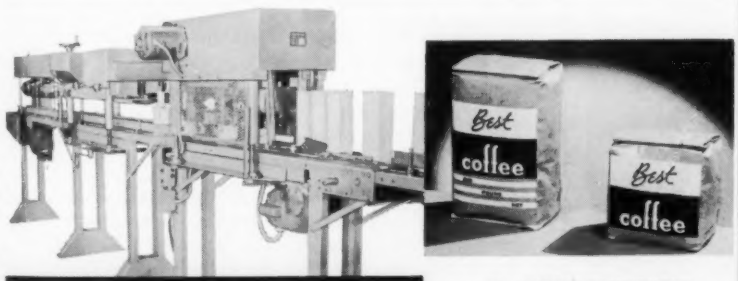
■ Urethane Foam Cushioning

Mobay Chemical Co. has a 20-page booklet reviewing the details of its urethane foams. Properties and performance features are illustrated and described, and range of applications included.

Circle No. 133

■ Plastic Bottle Materials

Hercules Powder Co. has a brochure, "The plastic bottles come of age," which analyzes the relative advantages of high-density polyethylene and polypropylene plastic bottles compared with glass and metal containers. A point by point list of

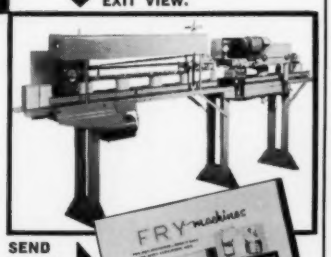


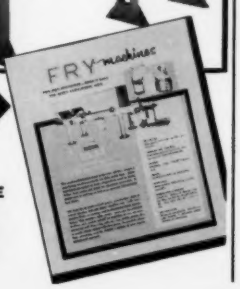
IT'S IN THE BAG!

Fry Model CBG and Tommy Tucker

▲ SIMPLE ADJUSTMENT TO PROPER BAG HEIGHT.

▼ EXIT VIEW.





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  Shipping and carrying strength...
  Moisture protection...
  Sift-proof closures... Neat appearance.
- **ASSURE YOUR PRODUCT:**
  Safe, compact packaging...
  Long shelf life... Fresh quality.

AUTOMATION SAVES SALARIES

Use Fry Models CBG Bag Sealer Gluer, the Tommy Tucker and v-30 Settler for a continuous, automatic, straight-line operation from filler to shipping carton.

GEORGE H. FRY COMPANY

42 East Second Street, Mineola, N. Y. — Pioneer 6-6230

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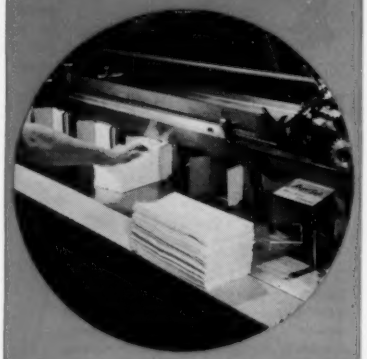


WITH CECO MODEL 40

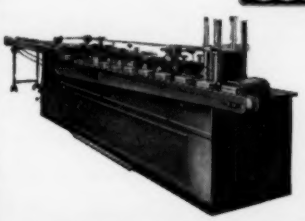
AUTOMATIC CARTONER

- *Handles 200 to 500 count cartons at speeds up to 90 per minute.*
- *Changeover from one size to another takes only twenty minutes.*

Here at relatively low cost is the perfect combination of speed and flexibility. With the product inserted manually, the Ceco Model 40 handles a glue seal end carton fully automatically from hoppering through sealing.

The Model 40 can also be had to handle heavy weight board or corrugated as well as tuck style, lock style or, a carton having one glue end and one tuck end. It is ideal for bagged products, bakery products, frozen foods, drug products, hardware, etc. For full details write for a 40 Brochure.

CECO



CONTAINER EQUIPMENT CORPORATION

78-88 LOCUST AVENUE, BLOOMFIELD, N. J.

Carton 40-60 Units Per Minute—with just one operator—at LOW MACHINE COST

Just one compact, efficient machine—with just one operator—will handle almost any product you package in reverse tuck folding cartons, at the rate of 10,000, 15,000, 18,000 packages per day. Yet, installed and turning out steady production, costs less than $5000!

REDINGTON automax® CYCLE CARTONER

feeds and forms cartons, places them in conveyor pockets. One operator places the item to be cartoned in each of the three loading troughs, then pushes slide forward and back. AUTOMAX tucks in end flaps, discharges finished packages, restarts the cycle—*all automatically!*

Solidly built for long, trouble-free service, AUTOMAX is just 70″ long, 30″ wide, weighs only 750 lbs. It's caster-mounted—move it anywhere in the plant you need it, even where floor space is limited. Perfect for tubes, bottles, toys, parts, hardware—whatever you carton. *Adjustable.*

★ ***Write for illustrated folder giving full details about AUTOMAX—priced to fit your budget.***

F. B. REDINGTON CO.
3022 ST. CHARLES ROAD, BELLWOOD, ILLINOIS
Chicago Phone: AUstin 7-4200 • Verona, N. J., CEnter 9-4608

Circle No. 276 on Card, Page 85

PACKAGING?

ELLISCO CANS are specially suited for YOUR PRODUCTS

Squares and Rectangular Cans 33 Base Sizes.

Round Screw Top Cans

Cans lithographed in your design and colors.

Round Slip Cover Cans. 52 Diameters. May be tape sealed.

Seamless Slip Cover Cans. Write for Bulletin 116.

Packaging industrial products? Let us quote on your requirements. We are specialists in the manufacture of cans to meet your needs, and offer:

1 many standard and special sizes.

2 numerous types of cans: screw top, friction top, slip cover and tear strip—plain or lithographed.

3 small or large quantities.

4 familiarity with Military Packaging Specifications.

Write, wire or call for samples and prices.

Ellisco

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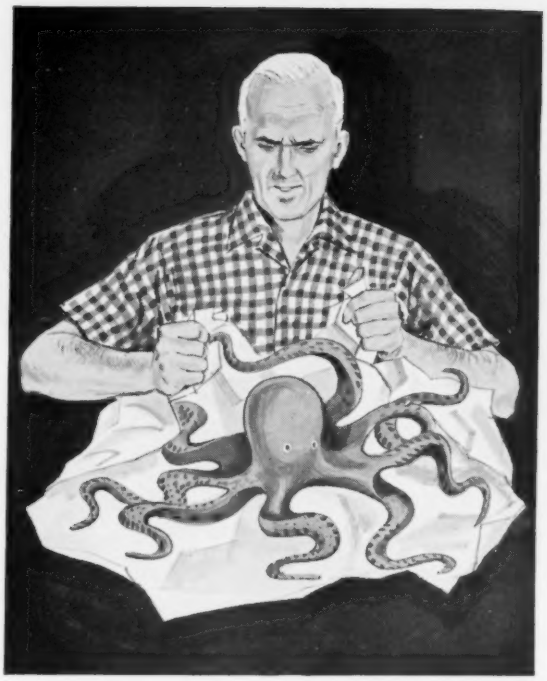
American & Luzerne Streets, Dept. P5
Philadelphia 40, Pa., BAldwin 3-3405



it's time to try CRYSTAL TISSUE

This man has a problem, but that's nothing new to men in the packaging field.

More and more packaging men are discovering Crystal makes tough tissues that can be handled, printed, sealed—do most anything that costlier papers, foils, films or fabrics can do.

Crystal tissues are now universally used because they can be stitched, twisted, laminated, impregnated, or what have you. Whatever your problem, chances are Crystal has or can develop the tissue you need.

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First name in tissues for over 60 years.

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The Crystal Tissue Company, Middletown, Ohio

I want samples and more information on Crystal Tissues for special applications. PE 560

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*Firm Name*_____

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*City*_____ *Zone*____ *State*_____

physical and chemical characteristics is given as well as a forecast of potential markets for these containers.

Circle No. 134

■ Protective Papers

Paterson Parchment Paper Co. offers a data sheet on a series of plastic-coated parchments, identified as No. 27-33T. Combining a high-gloss finish, crease resistance, moisture protection, and wet strength, this paper is available in plain or printed form. It can be used as general purpose wrapper for foods containing both moisture and fats, as printed outer or plain inner liner for spirally-wound tubes used for packaging foods or industrial products containing oils, as wrapper for protecting oiled metal parts against moisture, and as carton liner for packaging moisture-sensitive products. Sample included.

Circle No. 135

■ Transistorized Electronic Counter

Veeder-Root, Inc. has an information sheet describing and giving specifications for its electronic predetermining counter, Series 1604, Model R. Unit can be furnished with photohead to match specifications and is designed for operation by non-technical personnel. It is transsistorized and operates at speeds up to 500 counts/sec.

Circle No. 136

■ Industrial And Specialty Tissues

The Crystal Tissue Co. offers a fact file with sample swatches of basic tissue types which are available for industrial, converting, and specialty applications. The file outlines, describes, and illustrates the special characteristics of each type of tissue, explains how new tissues are developed for special requirements, and provides lists of examples of standard and unusual uses. The file is punched to fit a 3-hole notebook.

Circle No. 137

■ Cellulose Sheeting

Eastman Kodak Co., Cellulose Products Div., offers a 4-page bulletin, "Properties of Kodapak sheet," a thermoplastic cellulose ester sheet. Graphs and charts outline the physical properties of the three available types.

Circle No. 138

■ Heavy-Duty Corrugated

Stone Container Corp. offers a 4-page illustrated folder and sample of its heavy-duty, humidity-resistant corrugating medium, StoneCor, for shipping containers. Laboratory tests are reported, showing that 200-lb. test singlewall corrugated box with special medium exceeds (by 33 to 77 per cent) stacking strength of 200-lb. test regular box. Chart shows advantage of 200-lb. special board over 275-lb. regular board.

Circle No. 139

SYNTRON cost-cutting equipment of proven dependable Quality

feeds bulk materials at high rates

SYNTRON Vibra-Flow

VIBRATORY FEEDERS

—help reduce processing and packaging costs.

First, by dependable flow feeding of material to process equipment.

Second, by instant flow control, the power of vibration is instantly controllable for more uniform flow.

Third, by simplicity of design. The powerful electromagnetic drive assures long, trouble-free service with low maintenance costs.

Install SYNTRON Vibratory Feeders for efficient, dependable, low cost handling of all your bulk materials.

Write today for complete information

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Quality Equipment Since 1921

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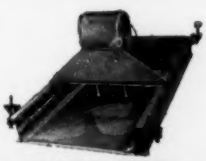
Other SYNTRON Equipment of proven dependable Quality

PARTS FEEDERS

VIBRATORY PACKERS



VIBRATING SCREENS

Note No. 16: Triple-wall corrugated boxes - Part III

By K. Q. Kellicutt,
Engineer, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture, Madison, Wisconsin

Introduction. How strong is a triple-wall corrugated box in top-to-bottom compression? That question is difficult, if not impossible, to answer with any degree of accuracy. Many factors affect compressive strength and need to be considered in the estimate.

First, the perimeter and height of the box in question must be known. Then there are such factors as the weights and kinds of component paperboards employed in the material, the placement and weight distribution of the paperboards within the built-up board, the size and arrangement of the flutes in the board, the direction of the flutes with respect to the applied force, the efficiency of the scorelines, the effectiveness of the glue bonds, and the general quality of fabrication before any estimate can be made. Actual test values obtained in compression tests of triple-wall corrugated boxes at FPL do, however, give some indications.

Compressive Strength Of Triple-Wall

To design a corrugated box for specific compressive strength values calls for appropriate materials properly combined in the board from which the box is made. In combining the materials for a multiwall board, the arrangement of the fluted sections and the component paperboards is important, especially for triple-wall boxes that are over 12 in. high.

For box heights up to about 8 in., failure in compression is due primarily to crushing and rolling along the horizontal scores. In boxes between 8 and 12 in. high, failure is due mainly to a combination of crushing and buckling of the panels. But for boxes over 12 in. high, especially those 18 or 20 in. high, failure in compression is almost entirely the result of buckling. Before they buckle, the panels bow and are bent either outward or inward.

Because of this type of failure, the box material needs to be stiff and resistant to bending forces. As previously mentioned*, the greatest resistance to bending and eventual buckling will be achieved through the best possible fluting and liner arrangement in order to provide the highest moment of inertia and, in turn, stiffness.

The ideal board, made with conventional flutes and employing two 90-lb. and two 42-lb. liners, would consist of three A-flute sections with the heavier liners on the outside. Currently, such a board is not available.

The next thickest board, which is being made, consists of the same liner stock and arrangement just mentioned, made with two A-flute sections and a C-flute, with one A-flute section in the center. This board would provide boxes with about the same compressive strength as the board with three A-flute sections, when the box height did not exceed about 8 in. and failure resulted primarily from crushing. However, as height increased to a point where failure resulted from crushing and buckling, and eventually to heights where failure was due primarily to buckling, the box made with three A-flute sections would show its superiority.

Actual Box Compression Tests

In research on triple-wall corrugated boxes, a large number of compression tests have been made on commercially made boxes. Values of some of these tests, which were made after the boxes had been conditioned in an atmosphere maintained at 73°F. and 50 per cent R.H., are given for a variety of sizes in the table.

Some of the test values included in the table for C-A-A board were used for establishing the compressive strength standard of Federal Specification PPP-B-640b.

*Kellicutt, K. Q., "Note No. 14: Triple-wall corrugated boxes — Part I," PACKAGE ENGINEERING 5 (1960), No. 3 (March), p. 122.
Kellicutt, K. Q. and Peters, C. C., "Note No. 7: Relationship of moment of inertia to stiffness of corrugated board," PACKAGE ENGINEERING 4 (1959), No. 8 (August), p. 84.
———, "Note No. 15: Triple-wall corrugated boxes — Part II," PACKAGE ENGINEERING 5 (1960), No. 4 (April), p. 122.

Maximum Top-To-Bottom Compressive Strength Of Empty Regular-Slotted Triple-Wall Corrugated Boxes Having Various Fluting Arrangements*

Lot No.	Box Length, Width, Depth (in.)	Perimeter Of Box (in.)	Compressive Strength (lb.) Flute Arrangement Of Triple-Wall C-A-A	C-A-C	C-A-B	C-B-A
1	11⅛ x 10⅝ x 10	43½	3,998			
2	13 x 13 x 8	52	5,167			
3	13 x 13 x 12	52	4,611			
4	13 x 13 x 18	52	4,363			
5	14¼ x 14¼ x 15	57			4,009†	
6	18 x 18 x 18	72	5,260			
7	21 x 20 x 15	82		5,602		
8	21 x 21 x 12	84		6,400†		
9	21½ x 22 x 13	87			6,400	
10	25½ x 21½ x 12	94	9,447			
11	24 x 24 x 8	96	8,765			
12	24 x 24 x 12	96	8,193			
13	24 x 24 x 12	96			5,480†	
14	24 x 24 x 12	96				5,272†
15	24 x 24 x 18	96	6,875			
16	26-11/16 x 25½ x 20⅝	103⅞	8,353			
17	42¼ x 28¼ x 32¾	141½	8,310†			
18	36 x 36 x 18	144	9,204			
19	52 x 34 x 34	172			7,922†	

*All boxes were made from triple-wall board that had 90-lb. outer liners, 42-lb. inner liners, and 26-lb. corrugating medium.
†Below the proposed compressive strength standard of Federal Specification PPP-B-640b.

It is interesting to notice the transition that takes place in going from a crushing failure through a combination of crushing and buckling to a failure that is primarily the result of buckling. For example, the boxes in Lots 2, 3, and 4 (see table) were all from the same material and differed only in height, yet the compressive strength values were found to be 5,167, 4,611, and 4,363 lb. for the 8-, 12-, and 18-in.-high boxes, respectively. The same relationship exists for a large cross section and may be seen by comparing the loads for boxes of Lots 11, 12, and 15 of the table, which also were made from the same board.

Another interesting comparison can be made between the compressive-strength values of the boxes in the table and the moment-of-inertia values that were included in Note No. 15. The actual moment of inertia for the C-A-A board was found to be 0.006127 in.⁴/in. and is about 1.5 times as great as the hypothetical moment for a C-B-A, 0.004176 in.⁴/in., which would be very close to the actual moment for the C-B-A board. Lot 12 boxes attained a maximum compressive load of 8,193 lb., which was about 1.6 times as great as for Lot 14 boxes, which were of the same size but made from the C-B-A material.

Lot 12 boxes had a compressive-strength value that was about 1.5 times as great as that of Lot 13 boxes made from C-A-B material, while the moment of inertia for the board of Lot 12 was about 1.3 times as great as the hypothetical value for C-A-B, which also would be close to the actual value for the board.

Stacking Strength

Since they have extremely high compressive strength, triple-wall corrugated boxes can sustain heavy loads for long periods of time in storage. This was found to be true in some dead-load tests that were conducted in an atmosphere maintained at 73°F., 50 per cent R.H.

Boxes used for this purpose were from Lot 9 of the table. Compressive strength established for this lot (machine test load) was 6,400 lb. One box sustained a dead load of almost 2 tons—3,969 lb.—for 152 days, while a second box from the lot sustained a dead load of 3,462 lb. for 333 days. The dead loads were 62 and 54 per cent of the machine test load for Boxes 1 and 2, respectively. *(End)*

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Corrosion need not mar your food package

(Continued from Page 73)

zen foods at temperatures above 0°F. accelerates any corrosive action that may occur, and gives the investigator an indication of what may be expected from a certain product in a specific package. (See Table VI.)

Huckleberries, tomatoes, blueberries, and mushrooms should be packaged in containers with a protective coating during storage at 0°F. In addition, artichokes, pineapple, avocados, apricots, and plums will also require coated containers if storage temperatures are not consistently maintained at 0°F. or colder.

Generally, a company packaging individual foods and/or entrees with low pH values and even slightly high concentrations of salt could eliminate any danger of corrosion by coating the inside surfaces of containers with a protective coating. We strongly recommend that containers for foodstuffs of unknown corrosion potential be coated until suitable storage tests can be performed to determine the shelf life to be expected when stored at expected temperatures. Bare containers can be completely satisfactory *if* the shelf life does not exceed the time an unprotected container can resist corrosion. *(End)*

Effective layouts for today and tomorrow

(Continued from Page 75)

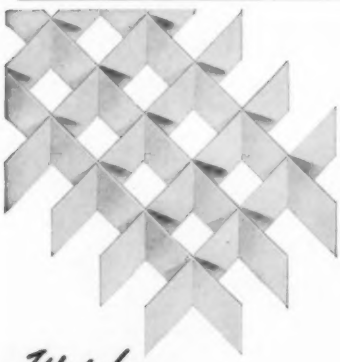
all sorts of special changes. If your sales department decides to insert a special coupon, to apply a new case sticker, to package a merchandise premium, to present a multiple-pack deal, can your layout handle it? Layout experts leave space for these jobs now, well knowing that tomorrow's requirements most likely will call for them.

Conclusion

Every flow line in the factory finds its way ultimately to the packaging department. The output of every factory department ends up here. Futher, if packaging slows down, it can back up the whole factory.

Another point: By the time materials reach the packaging department, they have accumulated their full load of manufacturing dollars. More than at any other point in the plant, the company's money is tied up in them. Packaging layout must provide efficient production handling so that none of that money is lost.

Still another: Packaging determines the initial impact that your product makes on the consumer. It must be of the highest discernible quality. The packaging layout has to be capable of delivering the kind of job that the package designer visualized. The design of a package often implies the design of a layout. And, by a symbiotic relationship, it may be on the strength of the layout that the success of the package depends. *(End)*



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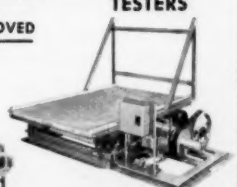

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What we think

Users should not shift research load to suppliers

One of the biggest temptations facing any top management is to see just what departments or activities it can get along without. We understand that the famed meat packer, G. F. Swift, once advised his people something like this: "Whenever you see a lot of carpenters, tradesmen, or artisans around, get rid of them. Then, if you really need them, they will find their way back." Unfortunately, some technical packaging functions are just as vulnerable to managerial experimentation as those luckless carpenters back in the old days in the stock yards. Our point here is that, before you cut back any important packaging function, be sure you know what you are doing.

During recent months, we have had disquieting reports of several companies cutting back ("decentralizing" is the polite word) certain packaging functions. We understand for example, a food products company thinks its packaging suppliers are doing the same sort of research its own staff has been conducting. Therefore, it is paring down its own department to avoid "duplicating" the supplier research.

In another instance, a company moved the key staff packaging people from corporate headquarters to a distant state—ostensibly to place them at the operating level. Another firm is shifting the packaging research burden to its various divisions, but the effect is that of whittling away the central packaging research unit.

Don't stretch supplier research too far

We have hobnobbed with enough of the research people in packaging supplier companies (especially among the producers of basic materials) to know that they are doing a good job and generally have an aggregation of real talent. They are making contributions to packaging. But, we think it poor judgment for a package-user company to lull itself into security believing that it can get its research "free" simply because the supplier is doing it.

It is unrealistic to expect that a flexible packaging supplier's research team would recommend that a user put its products into a folding carton or metal can. Likewise, only the naive would visualize an aluminum foil packaging research expert (on the payroll of a foil producer) urging any customer to package its product in a glass jar. This is no reflection on the objectivity of the supplier research experts. Their duty is to the companies employing them and their job is to expand the correct use of their firm's materials by helping to solve applicability problems.

Users who think they can shift the burden of their research to the supplier might also consider just what that will do to the cost of packaging materials. It is true that the packaging supplier has to do a certain amount of research and furnish a given quantity of service—simply to be competitive. But if any user thinks a supplier can take on a growing burden of research and not pass it back in the form of higher material costs, he is in for a shock. Apparently some large users are impressed by just how far suppliers will go in order to retain big volumes of business. Even so, it is unsound to expect a supplier to carry a major load.

False economy: doing too little research

Queried on this point, the offending user companies would probably hasten to say that they have not abandoned their research and that they are not relying entirely on suppliers. We wonder if they realize just how far they are going in some of these cases. One of the best insurance policies a company can have is an adequate staff of package research units to augment "decentralized" or operating-level research and that of suppliers from the outside.

We think that some of these companies which have decimated their research forces will quietly reverse their decisions and that these "decentralized" researchers will gradually infiltrate back to some sort of packaging GHQ. In the meantime, how do you balance the savings accruing from decentralization against the cost of failing to keep abreast of packaging development? Your supplier has a lot to give you in the way of research help but, don't expect it to take on the whole job. Use its help wisely, but keep your own hand in the game, too.

Bruce Hoffman

Editor

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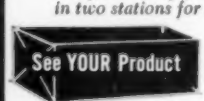

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